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Injuries

to Massachusetts Residents

1995-1999

Massachusetts Department of Public Health

**Injury Surveillance Program
Bureau of Health Statistics, Research and Evaluation**

**Injury Prevention and Control Program
Bureau of Family and Community Health**

April 2003



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Injuries to Massachusetts Residents

1995-1999

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April 2003

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Executive Summary

Executive Summary

Injuries are a major public health problem in Massachusetts and around the world. Injuries, in fact, claim more lives worldwide than any disease group, and the Centers for Disease Control and Prevention (CDC) has identified unintentional injuries as the leading cause of years of potential life lost in the United States.¹ Further, it is estimated that about one fourth of the U.S. population will sustain a nonfatal injury requiring medical attention each year.² These nonfatal injuries not only cause temporary pain and inconvenience they may also be associated with life long disability. And, due to the extent of this health problem, the economic impact is enormous. Nationwide, the financial cost of injuries is estimated at more than \$224 billion per year.³

In Massachusetts, injuries are the leading cause of death for people ages 1 to 44 years, and the seventh leading cause of death for all age groups combined. On an average day, between 1995 and 1999, there were 6 injury deaths, 123 injury-related hospitalizations, and an estimated 2,201 injury-related emergency department visits among Massachusetts residents. In 1999, the total charges of injury-related hospitalizations exceeded \$575 million.

In general, injury rates in Massachusetts compare favorably with the rest of the nation. In 1999, crude injury fatality rates in the U.S. were 54.1/100,000 compared with 35.6/100,000 in MA. Similarly, in the same year, crude homicide and suicide rates were considerably lower in MA compared with the U.S. (suicide: 6.8/100,000 vs. 10.7/100,000 and homicide: 2.0/100,000 vs. 6.2/100,000 in MA and U.S. respectively)⁴

This report describes the overall magnitude of the injury problem in Massachusetts, the causes of these injuries and the groups with the highest rates of injury in order that effective interventions may be developed, implemented and evaluated. Important findings are summarized below:

Injury Deaths

- 11,300 injury fatalities occurred among MA residents for the five years analyzed, an average of 2,260 injury deaths each year.
- Overall injury fatalities remained fairly constant between 1995 and 1999. Suicides, however, decreased 13% (from 494 to 430) and homicides decreased 42% (from 222 to 128).
- Injury fatality rates were highest among males. Male injury fatality rates were at least twice that of females between 1995 and 1999. Age-specific injury fatality rates were highest among those over 75 years.
- Poisonings, which includes drug overdoses, were the leading cause of injury death, taking an average of 509 lives each year. Motor vehicle traffic deaths, including deaths to pedestrians and bicyclists (average of 465 per year), and suffocations,

¹ Baker, S.P., Baker, T.D., *Science*, Vol 296, May, 2002, pg. 1237.

² Christofell, T., Gallagher, S. *Injury Prevention and Public Health*. Maryland: Aspen Publishers, 1999.

³ National Center for Injury Prevention and Control. *Injury Fact Book 2001-2002*. Atlanta, GA: Centers for Disease Control and Prevention.

⁴ Centers for Disease Control and Prevention. Web-based Injury Statistics Query and Reporting System (WISQARS) [Online]. (2002). Available from: URL: www.cdc.gov/ncipc/wisqars. [March 28, 2003].

including deaths due to choking and hanging (average of 280 per year), were the second and third leading causes of injury deaths in the Commonwealth.

Injury-related Hospital Discharges

- Among MA residents there were 223,915 injury-related hospital discharges for the five years analyzed, an average of 44,783 injury-related hospital discharges each year.
- Injury-related hospital discharge rates declined 6% between 1995 and 1999. Males experienced the greatest decline in injury-related hospital discharge rates (11%) compared with females, whose rates remained relatively stable.
- Falls were the leading cause of injury-related hospitalizations (average of 21,979 per year) outnumbering the next leading causes, motor-vehicle traffic and poisonings, by a factor of 5 to 1.
- Injury-related hospitalization rates were highest among females of all ages. Age-specific rates were highest among individuals 65 years and older.
- Hospitalizations for unintentional injuries were 7.5 times more frequent than hospitalizations for intentional injuries.

Injury-related Emergency Department Discharges

- In 1999, there were an estimated 737,976 injury-related emergency department (ED) discharges among MA residents.
- Falls were the leading cause of injury-related ED discharges accounting for an estimated 25% of these visits.
- Males had higher estimated rates of ED discharges for injuries compared with females until the age of 54.
- Injury-related ED discharges were highest among individuals 15-24 years. In 1999, an estimated 1 in 5 males within this age group was treated at an ED for an injury.
- Unintentional injuries made up an estimated 94% of the total injury-related ED discharges.

Specific Injuries

- *Poisonings:* In 1999, 70% of all poisoning deaths were associated with narcotics or hallucinogens. Seventy-one percent of the poisoning deaths in the Commonwealth were of undetermined intent.
 - Children between the ages of 1 and 4 years and people age 75 years and older were at greatest risk for an *unintentional* poisoning hospitalization (1995-1999). The predominant poisoning agent for 1- to 4-year olds was lead paint, while agents affecting the cardiovascular system was the predominant cause for those 75 years and older.
- *Motor Vehicle Traffic:* Motor vehicle traffic deaths declined 13% from 1995 to 1999. Nineteen percent of the motor vehicle traffic injury deaths during this time period were to pedestrians (n=449).
- *Suffocation:* The majority of suffocation deaths (61%) between 1995 and 1999 were suicides, while the majority of non-fatal hospitalizations for suffocation (93%) were unintentional in nature.

- *Falls:* Among MA residents there were an average of 206 fall-related deaths, 21,979 fall-related hospitalizations, and an estimated 180,950 non-fatal emergency department discharges due to falls each year. Among fall-related fatalities, 59% of fall deaths to people 65 years and older occurred at home while 18% of these deaths occurred at a residential institution (e.g., nursing home).
- *Firearms:* Firearm deaths, which ranked as the third leading cause of injury death in 1995 and the fifth leading cause of injury death in 1999, declined 34% during this period.

Additional Data Findings

- Thirty percent of injury fatalities among children under 1 year were homicides.
- Among all Massachusetts females, the highest rates for homicide were among those under 1 year of age.
- Children 10-14 years old were twice as likely to die of suicide (1.4 per 100,000) compared to homicide (0.7 per 100,000).
- The leading cause of suicide among males in Massachusetts was suffocation (hanging) and the leading cause of suicide among females was poisoning. Nationally, firearms are the leading cause of suicide for both sexes.

Conclusion

Massachusetts has a long history of injury surveillance and prevention activities. The success of these activities is evident in the Commonwealth's injury rates, which are among the lowest in the nation. However, the data presented here highlight the fact that the burden of injury is still substantial among Massachusetts residents and indicate the need for continued work in the area of injury prevention and control.

Most fatal and nonfatal injuries are preventable. Injuries generally follow a predictable sequence of events, and interventions aimed at reducing or eliminating injuries can occur at multiple points in this sequence. Strategies aimed at reducing injuries are often referred to as the "3E's" of prevention: education, enactment and enforcement of laws, and environmental modification and engineering. Using these widely accepted strategies and building on the Commonwealth's foundation in the field of injury prevention, we will continue to work towards reducing the number of preventable injuries to our residents.

Introduction

Introduction

Injuries are a major public health problem across the United States and in Massachusetts. In 1999, injuries were among the 10 leading causes of death in Massachusetts for all age groups (Table 1) and were the 7th leading cause of death for all ages combined.

In 1999, injuries overall, including homicides, suicides, unintentional injuries and injuries of undetermined intent, were the leading cause (38%) of death for Massachusetts residents ages 1-44 years (Figure 1).

Injury fatalities as a proportion of all deaths, for various age groups, can be seen in Figure 2.

Table 1. 10 LEADING CAUSES OF DEATH, MASSACHUSETTS RESIDENTS, 1999

	Age Groups								
Rank	<1	1-14	15-24	25-44	45-64	65-74	75-84	85+	All Ages
1	Short Gestation & LBW	Unintentional Injury		Cancer	Cancer	Cancer	Heart Disease	Heart Disease	Heart Disease
2	Congenital Malformations	Cancer	Suicide	Heart Disease	Heart Disease	Heart Disease	Cancer	Cancer	Cancer
3	SIDS	Congenital Malformations	Injury of Undeterm. Intent	Unintentional Injury	Chronic Liver Disease	Chronic Lower Respiratory	Stroke	Stroke	Stroke
4	Maternal Pregnancy Complications	Heart Disease	Homicide	Injury of Undeterm. Intent	Chronic Lower Respiratory	Stroke	Chronic Lower Respiratory	Influenza and Pneumonia	Chronic Lower Respiratory
5	Respiratory Distress	Suicide	Cancer	Suicide	Diabetes	Diabetes	Influenza and Pneumonia	Chronic Lower Respiratory	Influenza and Pneumonia
6	Complications of Placenta	Signs & Symptoms Inconclusive	Signs & Symptoms Inconclusive	HIV Disease	Stroke	Nephritis	Diabetes	Alzheimers	Diabetes
7	Bacterial Sepsis of Newborn	Septicemia	Heart Disease	Chronic Liver Disease	Unintentional Injury	Influenza and Pneumonia	Nephritis	Nephritis	Unintentional Injury
8	Intrauterine Hypoxia	Influenza and Pneumonia	HIV Disease	Signs & Symptoms Inconclusive	Suicide	Septicemia	Alzheimers	Pneumonitis	Alzheimers
9	Circulatory System Disease	Homicide	Congenital Malformations	Homicide	Septicemia	Chronic Liver Disease	Septicemia	Unintentional Injury	Nephritis
10	Unintentional Injury	In Situ Neoplasms	Septicemia	Stroke	Influenza and Pneumonia	Unintentional Injury		Septicemia	Septicemia

Data Source: Registry of Vital Records and Statistics, Massachusetts Department of Public Health.

Figure 1. INJURY AND NON-INJURY DEATHS TO MASSACHUSETTS RESIDENTS, AGES 1-44, 1999

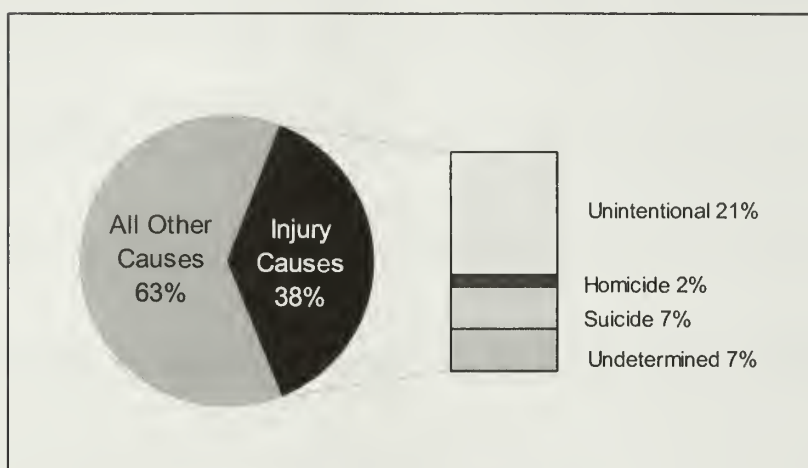
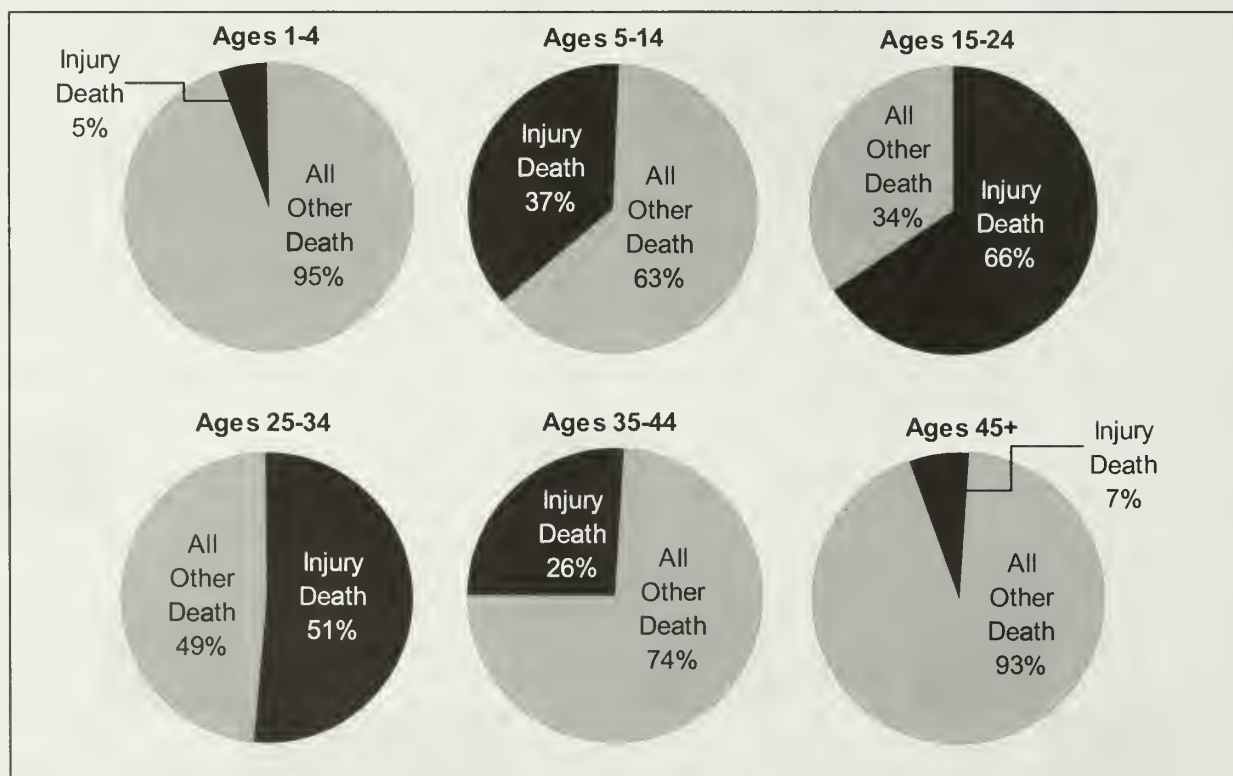


Figure 2. PROPORTION OF MASSACHUSETTS INJURY DEATHS COMPARED TO NON-INJURY DEATHS BY AGE GROUPS, 1999



Data Source: Registry of Vital Records and Statistics, Massachusetts Department of Public Health.

Nonfatal injuries impact the lives and productivity of a large number of individuals, and place significant demands upon the health care system. Many injuries lead to lifelong disabilities, and the collective physical, emotional, and economic cost of these events on our society is enormous.

Injuries are not “accidents.” Nearly all injuries are preventable, and most follow a very predictable sequence of events. By identifying the risk factors for and circumstances of these injuries we can more effectively develop strategies and interventions for prevention.

This data report provides information on fatal and nonfatal injuries to Massachusetts residents for the years 1995-1999 utilizing death, hospital discharge, and emergency department data sources. The report describes the magnitude of the problem, enumerates injuries by their causes and intents, assesses trends, quantifies some of the economic costs, and characterizes high-risk populations. It is intended to bring continued attention to the problem of injuries, and assist prevention programs, policy makers, researchers, and the general public in making further progress toward reducing injury-related deaths and disability in Massachusetts.

Section I:

Injury Deaths

Injury death data was obtained from the Registry of Vital Records and Statistics, MA Department of Public Health.

For the purposes of this report:

- for 1995-1998, an injury death was defined as any death with an ICD-9 external cause code ranging from 800-999 in the underlying cause of death field. Deaths due to surgical and medical complications (870-879), adverse effects of therapeutic drugs (930.0-949.9), and late effects of injuries (929, 959, 969, 989, 999) were excluded from these analyses.
- for 1999, an injury death was defined as any death with an ICD-10 external cause code ranging from V01-Y89 in the underlying cause of death field. Deaths due to surgical and medical complications (Y60-Y84, Y88.1-.3), adverse effects of therapeutic drugs (Y40-Y59, Y88.0), and the late effects of injuries (Y85-Y87, Y89) were excluded from these analyses.

In 1999, death certificates were coded for the first time using the International Classification of Diseases, Tenth Version (ICD-10). While comparability between ICD-9 and ICD-10 is relatively high overall for injury deaths, comparability for specific injury causes may differ. For this reason, 1999 injury deaths are presented separately for the intent and cause summaries. A dashed line is used to indicate the change of coding protocol in all injury death trend charts. Caution should be used in assessing trends over time.

Death data are based on a calendar year (January 1 – December 31).

Summary of Injury Deaths—1995-1998

by Cause and Intent

Massachusetts Residents

- Between 1995-1998 there were 9,062 injury fatalities to Massachusetts residents.
- The average-annual injury death rate was 36.5 per 100,000 residents.

Cause Categories: 1995-1998	INJURY INTENT					Total	Average Annual Rate/ 100,000
	Uninten- tional	Intentional		Undeter- mined	Other ¹		
		Suicide	Homicide				
Cut/pierce	6	51	154	1	0	212	0.9
Drowning/submersion	216	40	0	62	-	318	1.3
Fall	708	86	0	14	-	808	3.3
Fire/burn	210	17	7	4	-	238	1.0
<i>Fire/Flame</i>	208	16	7	4	-	235	0.9
<i>Hot object/substance</i>	2	1	0	0	-	3	**
Firearm	12	575	349	4	2	942	3.8
Machinery	15	-	-	-	-	15	**
Natural/environmental	62	1	-	1	-	64	0.3
<i>Dog Bites</i>	2	-	-	-	-	2	**
<i>Other Bites/Stings</i>	2	-	-	-	-	2	**
<i>Other natural/environmental</i>	58	1	-	1	-	60	0.2
Overexertion	1	-	-	-	-	1	**
Poisoning	132	434	0	1,448	0	2,014	8.1
Struck by, against	47	-	23	-	1	71	0.3
Suffocation/hanging	377	690	32	10	-	1,109	4.5
Transport Injuries	2,009	11	0	1	-	2,021	8.1
Motor vehicle traffic	1,885	-	-	-	-	1,885	7.6
<i>Occupant</i>	952	-	-	-	-	952	3.8
<i>Motorcyclist</i>	98	-	-	-	-	98	0.4
<i>Pedal Cyclist</i>	28	-	-	-	-	28	0.1
<i>Pedestrian</i>	373	-	-	-	-	373	1.5
<i>Unspecified*</i>	431	-	-	-	-	431	1.7
<i>Other</i>	3	-	-	-	-	3	**
Pedal cyclist, other	6	-	-	-	-	6	**
Pedestrian, other	44	-	-	-	-	44	0.2
Transport, other	74	-	-	-	-	74	0.3
Other specified--classifiable	25	27	8	3	0	63	0.3
<i>Caught By/Between</i>	0	-	-	-	-	0	**
<i>Foreign Body</i>	2	-	-	-	-	2	**
<i>Other</i>	23	27	8	3	0	61	0.2
Other specified--not classifiable	2	25	57	14	0	98	0.4
Unspecified	1,002	7	39	40	0	1,088	4.4
1995-1998 TOTALS	4,824	1,964	669	1,602	3	9,062	36.5

(N=9,062)

Data Source: Registry of Vital Records and Statistics, MDPH.

¹"Other" intent includes legal intervention and operations of war.

* Analysis of a sample of motor vehicle traffic "unspecified" deaths revealed that a large number of these should have been coded as motor vehicle traffic "occupant" deaths. Unpublished data, MDPH.

**Rates that are based on frequencies less than 20 may be unstable and are therefore not routinely reported.

Summary of Injury Deaths—1999¹ by Cause and Intent Massachusetts Residents

- In 1999 there were 2,238 injury fatalities to Massachusetts residents.
- The injury death rate was 35.6 for every 100,000 residents.

Cause Categories: 1999	INJURY INTENT					Total	Rate/ 100,000
	Uninten- tional	Intentional		Undeter- mined	Other ³		
		Suicide	Homicide				
Cut/pierce	0	16	25	1	0	42	0.7
Drowning/submersion	42	8	0	10	-	60	1.0
Fall	206	17	0	1	-	224	3.6
Fire/burn	48	1	4	5	-	58	0.9
<i>Fire/Flame</i>	48	1	4	5	-	58	0.9
<i>Hot object/substance</i>	0	0	0	0	-	0	**
Firearm	0	118	58	4	2	182	2.9
Machinery	5	-	-	-	-	5	**
Natural/environmental	25	0	-	0	-	25	0.4
<i>Dog Bites</i>	0	-	-	-	-	0	**
<i>Other Bites/Stings</i>	0	-	-	-	-	0	**
<i>Other natural/environmental</i>	25	0	-	0	-	25	0.4
Overexertion	0	-	-	-	-	0	**
Poisoning	52	99	1	381	0	533	8.5
Struck by, against	9	-	4	-	0	13	**
Suffocation/hanging	122	156	9	2	-	289	4.6
Transport Injuries	477	2	1	0	-	480	7.6
Motor vehicle traffic	427	-	-	-	-	427	6.8
<i>Occupant</i>	102	-	-	-	-	102	1.6
<i>Motorcyclist</i>	36	-	-	-	-	36	0.6
<i>Pedal Cyclist</i>	5	-	-	-	-	5	**
<i>Pedestrian</i>	76	-	-	-	-	76	1.2
<i>Unspecified*</i>	208	-	-	-	-	208	3.3
<i>Other</i>	0	-	-	-	-	0	**
Pedal cyclist, other	2	-	-	-	-	2	**
Pedestrian, other	25	-	-	-	-	25	0.4
Transport, other land ²	13	-	-	-	-	13	**
Transport, other	10	-	-	-	-	10	**
Other specified--classifiable	8	2	2	4	0	16	**
<i>Caught By/Between</i>	0	-	-	-	-	0	**
<i>Foreign Body</i>	0	-	-	-	-	0	**
<i>Other</i>	8	2	2	4	0	16	**
Other specified--not classifiable	1	10	5	2	0	18	**
Unspecified	266	1	19	7	0	293	4.7
1999 TOTALS	1,261	430	128	417	2	2,238	35.6

(N=2,238)

Data Source: Registry of Vital Records and Statistics, MDPH

¹ In 1999, death certificates nationwide were coded for the first time using the International Classification of Diseases Version-10. This coding protocol differs from that which was used in prior years and thus is reported separately. Caution should be used in assessing trends.

² Denotes a new classification.

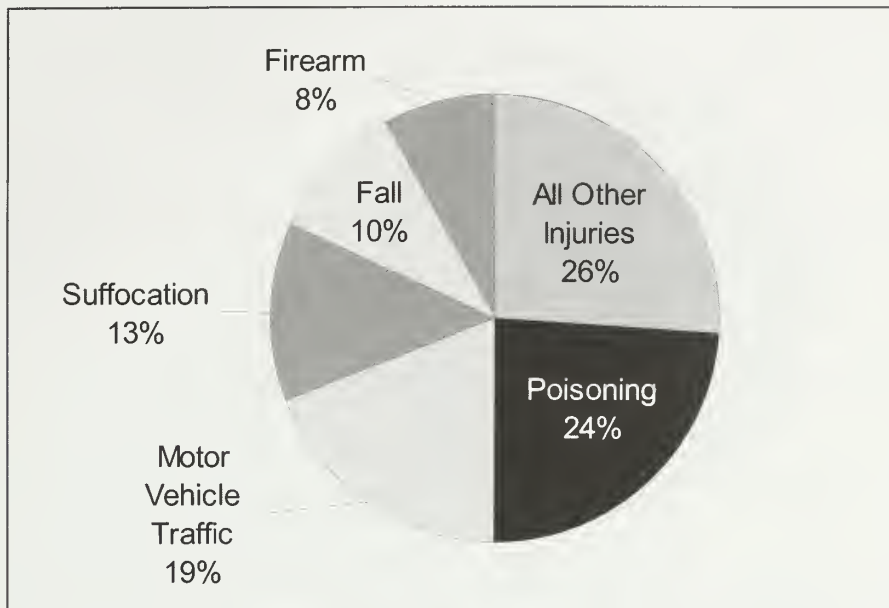
³ "Other" intent includes legal intervention and operations of war.

* Analysis of a sample of motor vehicle traffic "unspecified" deaths revealed that a large number of these should have been coded as motor vehicle traffic "occupant" deaths. Unpublished data, MDPH.

** Rates that are based on frequencies less than 20 may be unstable and are therefore not routinely reported.

Injury Deaths—Leading Causes in 1999

Massachusetts Residents



(N=2,238)

Data Source: Registry of Vital Records and Statistics, MDPH

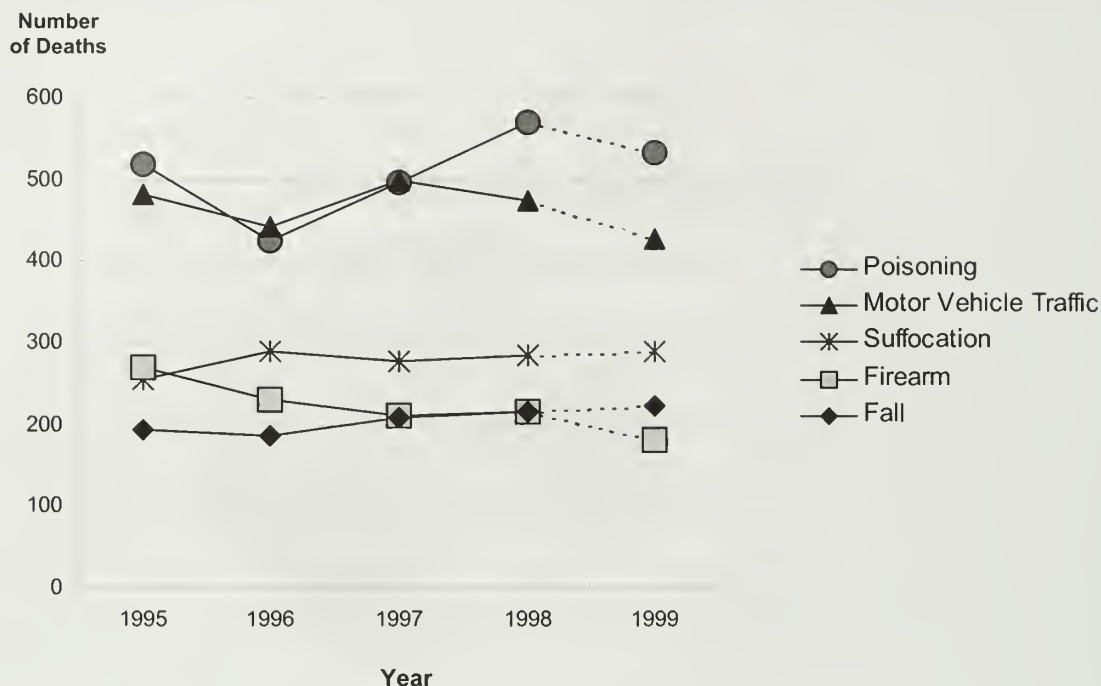
"Other" intent which includes legal intervention and operations of war (n=2), is not included.

In 1999:

- The five leading causes of injury death to residents of Massachusetts were: poisonings (n=533), motor-vehicle traffic (n=427), suffocation (n=289), falls (n=224), and firearms (n=182).
- Narcotics and hallucinogens were associated with 70% of poisoning fatalities.
- 76 pedestrians were killed in motor-vehicle incidents. Thirty percent (n=23) of these were persons 65 years and older.
- 54% of suffocation deaths were suicides. Males were 2 times more likely than females to complete a suicide by suffocation (e.g., hanging).
- 61% of fall fatalities were among residents 65 years and older.
- 118 of the 182 (65%) firearm fatalities were suicides.

Injury Deaths—Leading Causes by Year

Massachusetts Residents, 1995-1999



(N=11,300)

Data Source: Registry of Vital Records and Statistics, MDPH

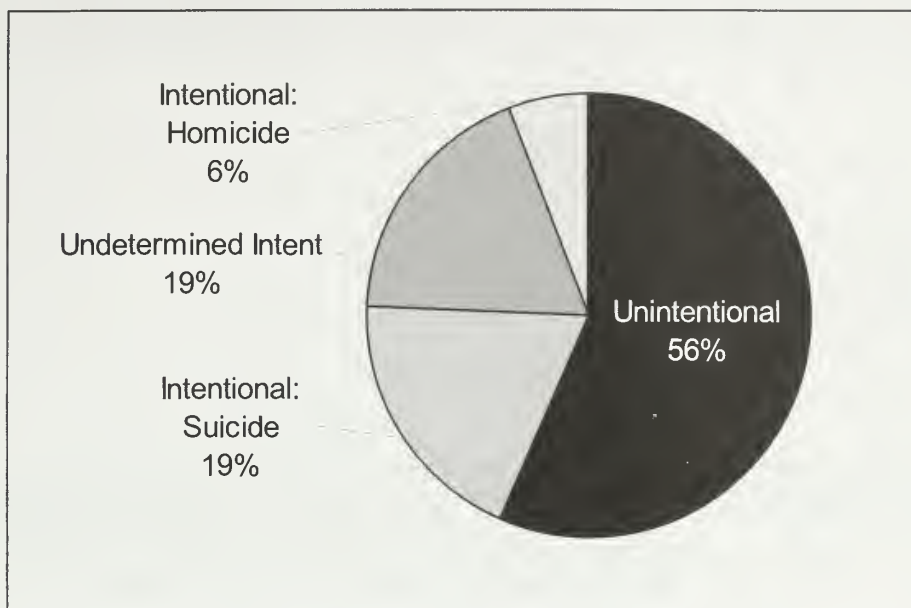
Note: in 1999 death coding changed from the ICD9 classification to ICD10, thus trends should be interpreted cautiously.

Between 1995 and 1999:

- Poisoning was the most common cause of death for all years studied, with the exception of 1996 when it ranked second. Poisonings accounted for 2,547 (22.5%) of the injury fatalities during this period.
- Motor vehicle-related traffic deaths were responsible for 2,324 (20.5%) of the injury deaths.
- Suffocation was the third leading cause of injury death for all years except 1995. 1,398 Massachusetts residents died of suffocation during this period. 29% of all suffocation deaths were due to choking on food or an object.
- Firearm deaths, which ranked as the third leading cause of injury death in 1995 and the fifth leading cause of injury death in 1999, declined by 33% during this period.
- There were 1,032 fall-related injury deaths to Massachusetts residents for this 5-year period.

Injury Deaths—Intent of Injury, 1999

Massachusetts Residents



(N=2,238)

"Other" intent which includes legal intervention and operations of war (n=2), is not included.

Data Source: Registry of Vital Records and Statistics, MDPH

In 1999:

- Unintentional injuries accounted for approximately 56% of all injury-related fatalities, 25% were intentionally inflicted either by another person (homicide) or by the victim (suicide). Nineteen percent were of undetermined intent.
- Of the 558 intentional injury deaths sustained to Massachusetts residents during 1999, 77% were suicides and 23% were homicides.

Injury Deaths—Leading Causes by Intent, 1999

Massachusetts Residents

Unintentional		Intentional: Suicide		Intentional: Homicide		Undetermined Intent	
MV Traffic-related 427		Suffocation 156		Firearms 58		Poisoning 381	
Fall 206		Firearm 118		Cut/pierce 25		Drowning 10	
Suffocation 122		Poisoning 99		Suffocation 9		Fire/burn 5	
All Other 506		All Other 57		All Other 36		All Other 21	
Total	Rate*	Total	Rate*	Total	Rate*	Total	Rate*
1,261	20.0	430	6.8	128	2.0	417	6.6

(N=2,238)

Data Source: Registry of Vital Records and Statistics, MDPH

"Other" intent which includes legal intervention and operations of war (n=2), is not included.

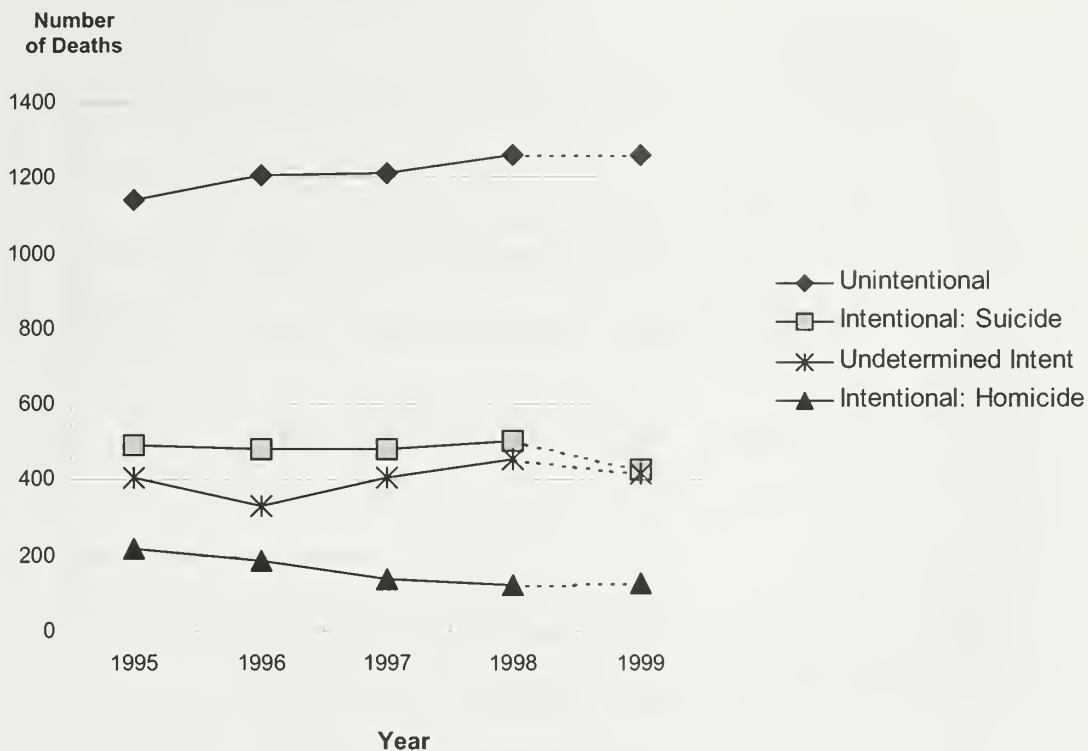
*Rates are per 100,000 residents.

The leading causes of injury deaths in 1999 varied by intent:

- Motor vehicle crashes were the leading cause of unintentional injury death. Twenty-eight percent of Massachusetts drivers involved in fatal motor vehicle traffic crashes in 1999 had a blood alcohol count of 0.08 or higher.
Source: Fatal Analysis Reporting System, National Highway Traffic Safety Administration
- Suffocation was the leading cause of suicide. Seventy-nine percent of suffocation-related suicides were among males; 56% were among people ages 20 to 44 years.
- Firearms were the leading cause of homicide. Twenty-two percent of these cases were among Boston residents.
- Poisoning was the leading cause of injury deaths of undetermined intent. The majority of poisoning deaths of undetermined intent (88%) were due to narcotics and other hallucinogens.

Injury Deaths—Intent of Injury by Year

Massachusetts Residents, 1995-1999



(N=11,300)

Data Source: Registry of Vital Records and Statistics, MDPH

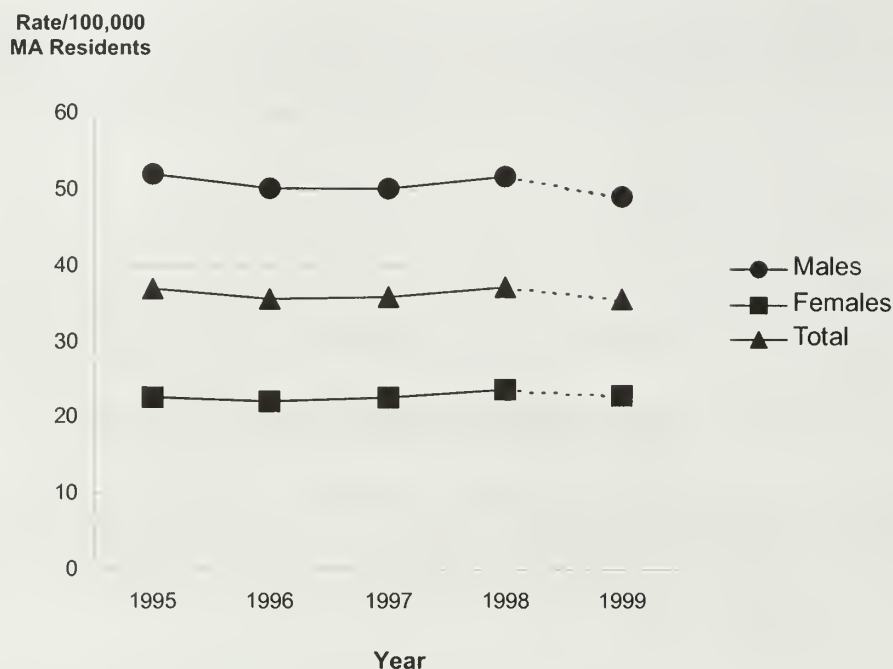
Note: in 1999 death coding changed from the ICD9 classification to ICD10.

Between 1995 and 1999:

- Unintentional injury fatalities remained stable.
- Suicides remained relatively stable from 1995 through 1998 but decreased approximately 15% from 1998 (n=503) to 1999 (n=430).
- Homicides decreased 42% during the 5-year period, from 222 in 1995 to 128 in 1999.

Injury Death Rates—by Sex and Year

Massachusetts Residents, 1995-1999



(N=11,300)

Data Source: Registry of Vital Records and Statistics, MDPH

Note: in 1999 death coding changed from the ICD9 classification to ICD10, thus trends should be interpreted cautiously.

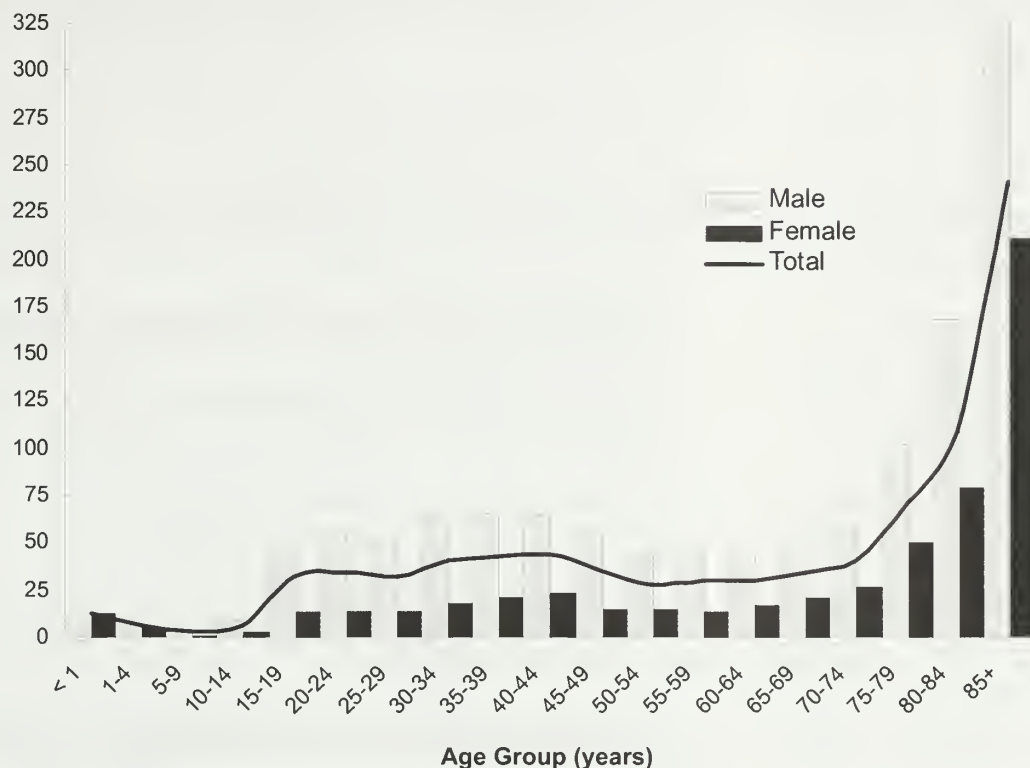
Between 1995 and 1999:

- Overall, injury-related fatality rates in Massachusetts have remained relatively constant between 1995 and 1999.
- Males experienced higher injury fatality rates than females for all years studied. Injury fatality rates in males were at least twice that seen for females.
- The leading causes of injury deaths for males were poisonings (n=1,797), motor vehicle traffic crashes (n=1,559), and firearms (n=1,002).
- The leading causes of injury deaths for females were motor vehicle traffic crashes (n=765), poisonings (n=750), and suffocation (n=423).

Injury Death Rates—by Sex and Age Group

Massachusetts Residents, 1995-1999

Average Annual Rate/100,000
MA Residents



(N=11,300)

Data Source: Registry of Vital Records and Statistics, MDPH

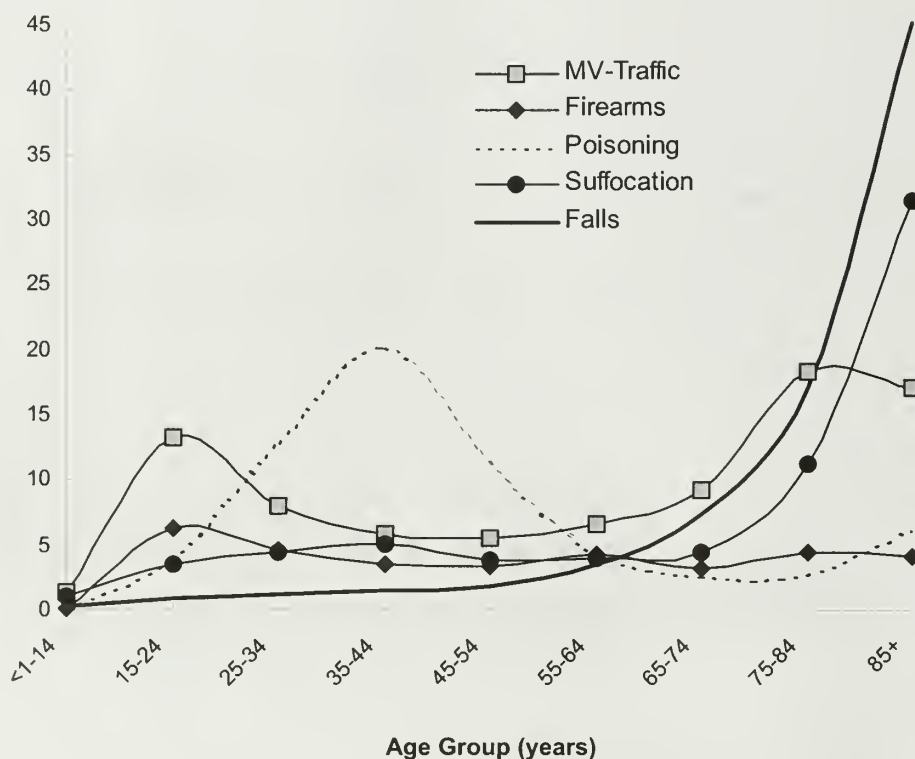
The rates of injury death varies throughout the lifespan. Between 1995 and 1999:

- Males had higher injury death rates than females throughout the lifespan, with the exception of the under 1 year population, when female injury death rates were slightly higher.
- Among children ages 14 and under, the very young (less than 1 year) had the highest rates of injury death.
- Injury death rates remained relatively constant between ages 15 and 49 years. Males in these age groups experienced 2.7 to 4.1 times greater rates of injury death than females.
- Injury fatality rates were highest among older adults. Persons ages 85 and older had an injury fatality rate of 241 per 100,000—a rate 7.8 times higher than that of persons ages 65-69 (34 per 100,000).

Injury Death Rates by Age Group for Motor Vehicle Traffic, Firearm, Poisoning, Suffocation, and Fall Injuries

Massachusetts Residents, 1995-1999

Average Annual
Rate/100,000 MA Residents



(N=9,830)

Data Source: Registry of Vital Records and Statistics, MDPH

Between 1995 and 1999:

- Motor vehicle traffic and firearm deaths were the predominant causes of injury death in the 15-24 year age group.
- Poisonings were the leading cause of injury death for age groups 25 through 54 years. Seventy-seven percent of these poisonings were of undetermined intent.
- For persons ages 35 to 44, the risk of death by poisoning was 3.4 times higher than the risk of death by motor vehicle traffic, the second leading cause of injury death in this age group.
- Fall, suffocation, and motor vehicle-related deaths were the leading causes of injury deaths in older adults, ages 65 and older.

Injury Deaths—Leading Causes by Age Group

Massachusetts Residents, 1995-1999

Children								
< 1 year			1-4 years			5-9 years		
Cause	number	percent	Cause	number	percent	Cause	number	percent
Suffocation	16	30.8	Drowning	23	23.2	MV Traffic	19	31.7
Drowning	5	9.6	Fire/Burn	16	16.2	Drowning	14	23.3
MV Traffic	5	9.6	Suffocation	15	15.2	Fire/Burn	10	16.7
Other-classifiable	5	9.6	MV Traffic	15	15.2	Fall	4	6.7
Struck By	3	5.8	Fall	9	9.1	N/A	0	0.0
Other Injuries	18	34.6	Other Injuries	21	21.2	Other Injuries	13	21.7
TOTAL	52	100.0	TOTAL	99	100.0	TOTAL	60	100.0
Average annual rate: 12.8 per 100,000			Average annual rate: 6.1 per 100,000			Average annual rate: 2.9 per 100,000		

Youth					
10-14 years			15-19 years		
Cause	number	percent	Cause	number	percent
MV Traffic	44	35.5	MV Traffic	294	44.7
Suffocation	31	25.0	Firearm	131	19.9
Drowning	13	10.5	Suffocation	81	12.3
Firearm	11	8.9	Drowning	29	4.4
Fire/Burn	7	5.6	Poisoning	40	6.1
Other Injuries	18	14.5	Other Injuries	83	12.6
TOTAL	124	100.0	TOTAL	658	100.0
Average annual rate: 6.4 per 100,000			Average annual rate: 32.1 per 100,000		

Adult					
20-44 years			45-64 years		
Cause	number	percent	Cause	number	percent
Poisoning	1,812	37.2	Poisoning	550	27.8
MV Traffic	1,000	20.5	MV Traffic	382	19.3
Firearm	578	11.9	Suffocation	250	12.6
Suffocation	560	11.5	Firearm	241	12.2
Fall	170	3.5	Fall	161	8.1
Other Injuries	749	15.4	Other Injuries	396	20.0
TOTAL	4,869	100.0	TOTAL	1,980	100.0
Average annual rate: 38.9 per 100,000			Average annual rate: 31.1 per 100,000		

Older Adult					
65-74 years			75+ years		
Cause	number	percent	Cause	number	percent
MV Traffic	203	24.9	Unspecified	1,070	40.6
Fall	161	19.8	Fall	507	19.3
Unspecified	124	15.2	MV Traffic	364	13.8
Suffocation	97	11.9	Suffocation	344	13.1
Firearm	71	8.7	Firearm	89	3.4
Other Injuries	159	19.5	Other Injuries	259	9.8
TOTAL	815	100.0	TOTAL	2,633	100.0
Average annual rate: 37.2 per 100,000			Average annual rate: 130.6 per 100,000		

- Children ages nine years and younger had an average annual injury death rate of 5.2 per 100,000.
- Youth between the ages of 10 and 19 had an average annual injury death rate of 19.7 per 100,000.
- Adults 20 to 64 years of age had an average annual injury death rate of 36.3 per 100,000.
- Older Adults ages 65 and over had an average annual injury death rate of 82 per 100,000.

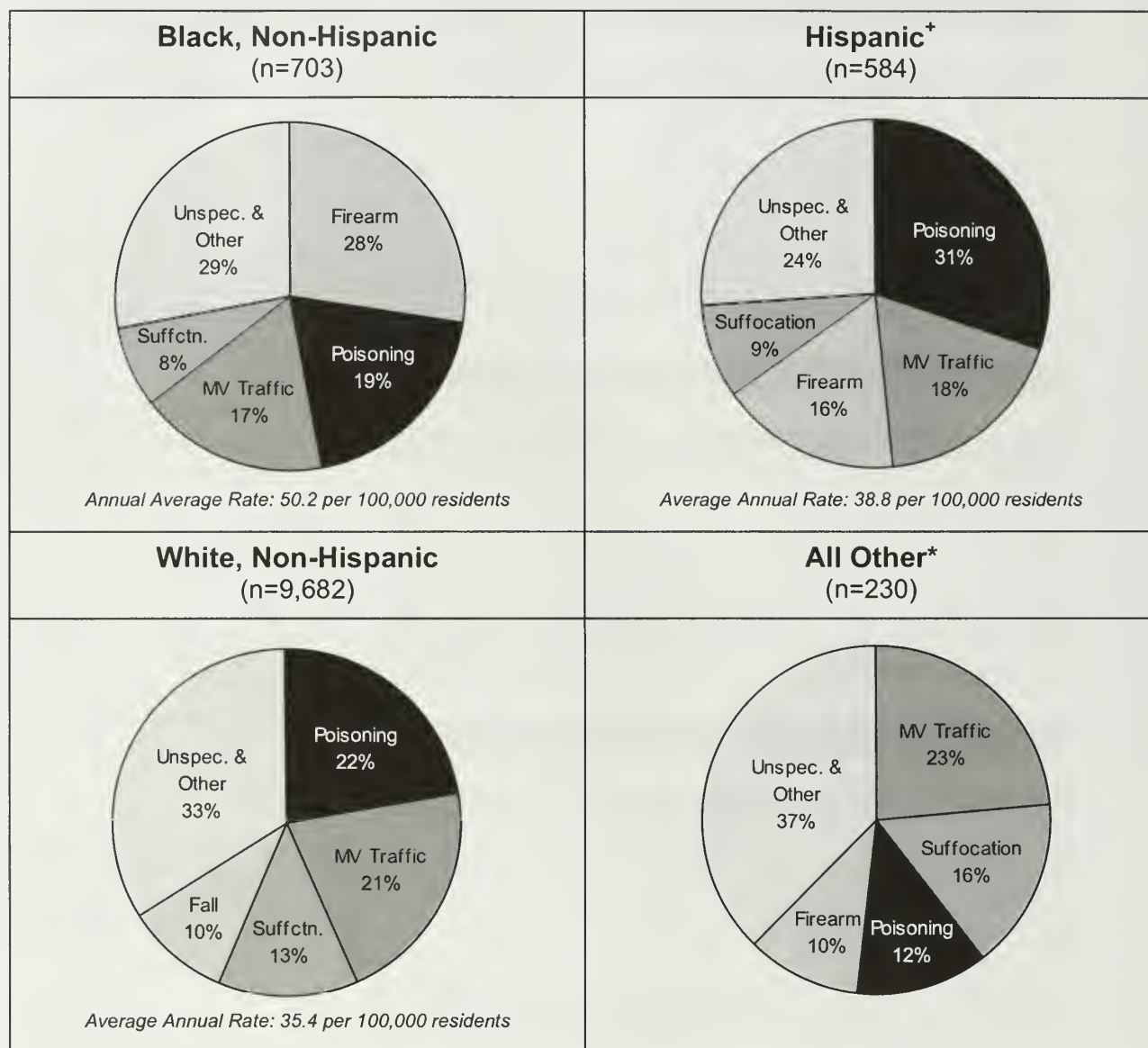
Selected definitions:
"Other-classifiable" includes categories such as caught by or between objects, foreign bodies, and maltreatment.

(N=11,300)

Data Source: Registry of Vital Records and Statistics, MDPH

Injury Deaths—Leading Causes by Race/Ethnicity

Massachusetts Residents, 1995-1999



(N=11,300)

Data Source: Registry of Vital Records and Statistics, MDPH

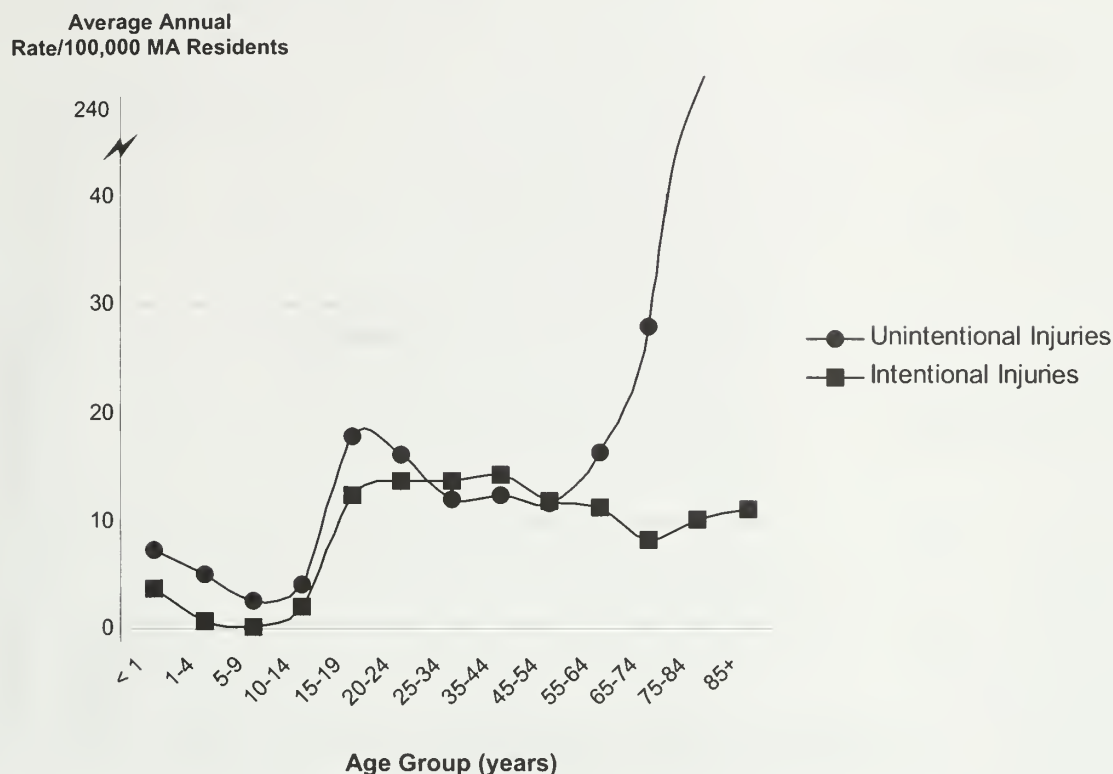
⁺Death rates for Hispanic persons should be interpreted with caution due to inconsistencies in reporting on the death certificate compared to census data.

*All Other includes American Indian, Asian or Other Pacific Islander, Other and Unknown races.

Between 1995 and 1999:

- Poisonings were the leading cause of injury death for Hispanic residents (31%) and white, non-Hispanics (22%).
- Firearms were the leading cause of injury death for black, non-Hispanic residents (28%).

Injury Death Rates—Intent by Age Group Massachusetts Residents, 1995-1999



(N=9,276)

Please note change of scale on the vertical axis.

Data Source: Registry of Vital Records and Statistics, MDPH

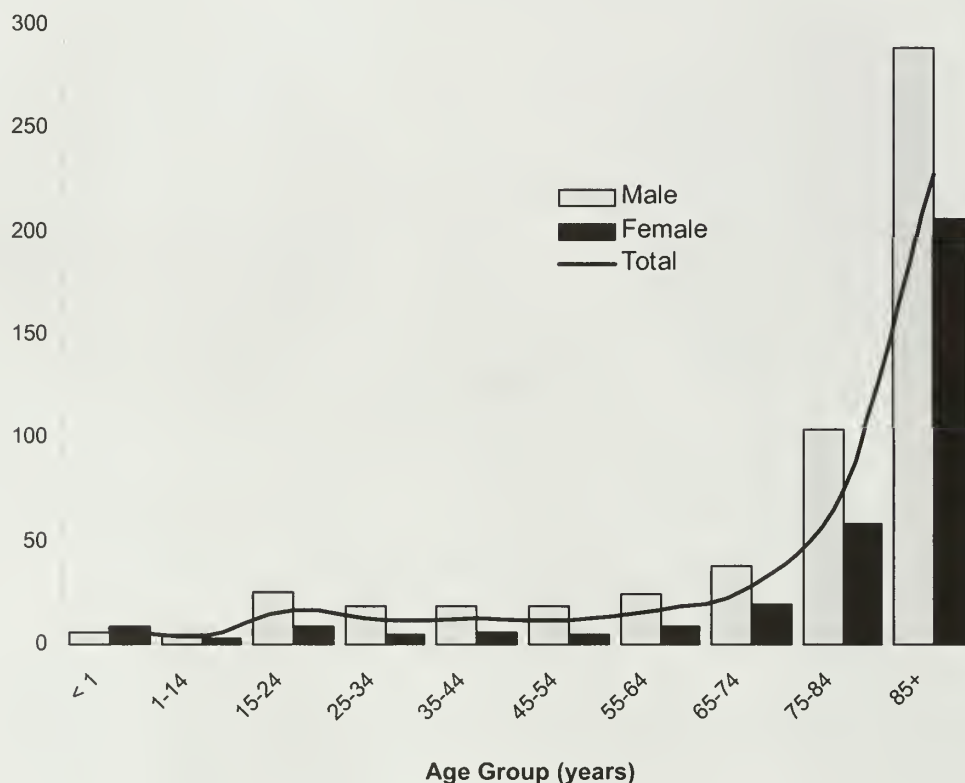
Between 1995 and 1999:

- Unintentional injury death rates closely parallel intentional injury death rates until age groups 65 years and older, after which point unintentional injury death rates increase dramatically.
- Persons ages 65 years and older had an unintentional injury death rate 2.6 times that of persons under the age of 65. The unintentional injury death rate was highest among persons 85 years and older (238.7 per 100,000).
- Among Massachusetts residents 65 years and older, 29% of unintentional injury deaths where cause was specified were due to falls and 25% were motor vehicle-related.

Unintentional Injury Death Rates—by Sex and Age Group

Massachusetts Residents, 1995-1999

Average Annual
Rate/100,000 MA Residents



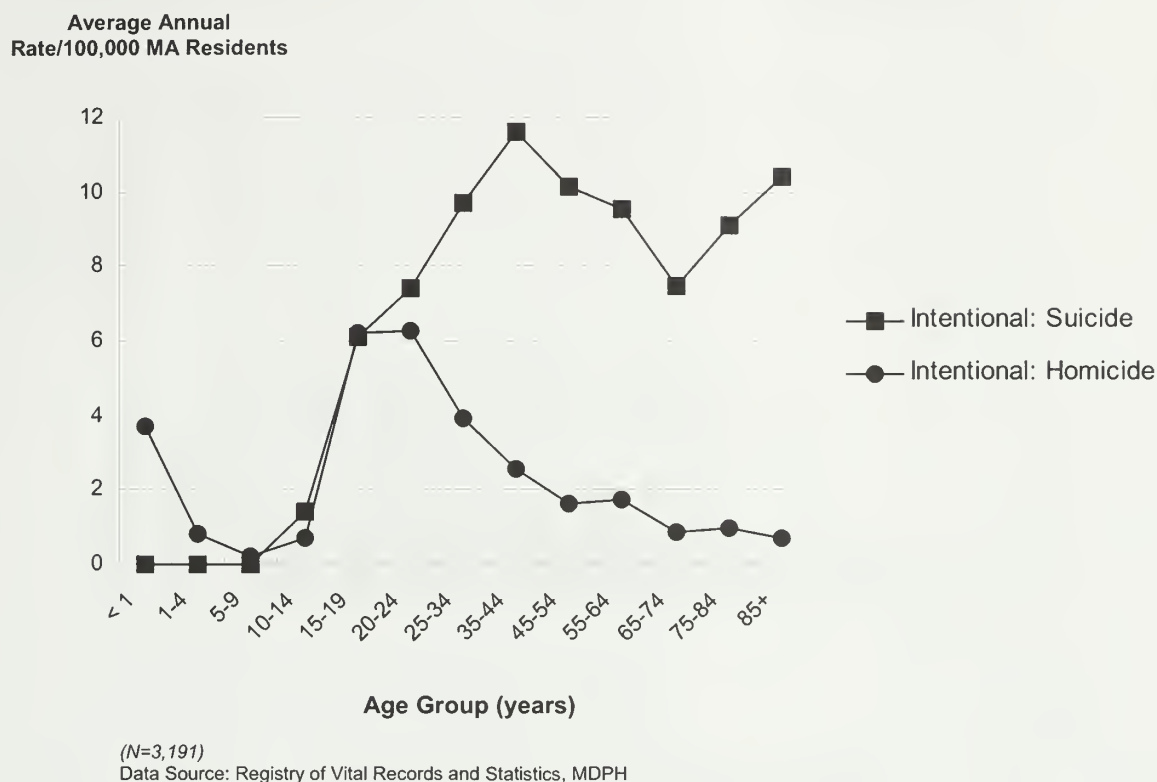
(N=6,084)

Data Source: Registry of Vital Records and Statistics, MDPH

Between 1995 and 1999:

- Males had higher overall unintentional injury death rates compared with females (24.2 and 15.2 respectively) for every age group, with the exception of children less than 1 year, where females had higher rates.
- Persons ages 85 and older had the highest rates of unintentional injury death.

Intentional Injury Death Rates— Suicide and Homicide by Age Group Massachusetts Residents, 1995-1999

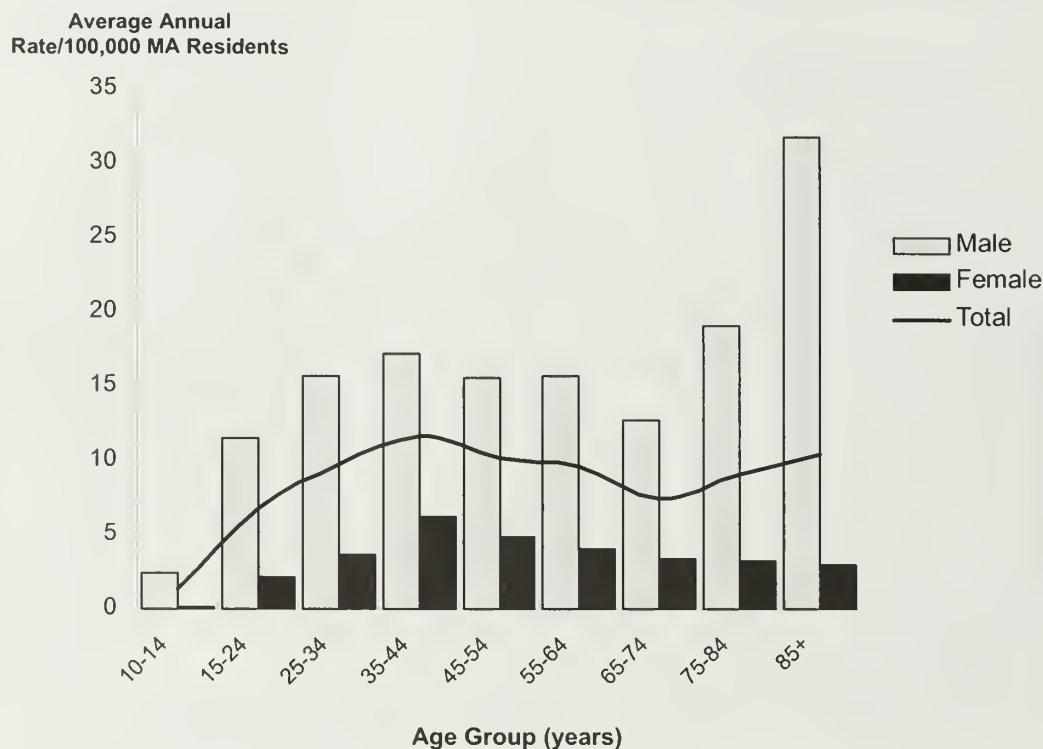


Between 1995 and 1999:

- For Massachusetts residents overall, suicide rates (7.7 per 100,000) were approximately 3 times higher than homicide rates (2.6 per 100,000).
- By specific age groups:
 - 10-14 year olds were twice as likely to die of suicide (1.4 per 100,000) compared to homicide (0.7 per 100,000)
 - 15-19 year olds had relatively equal rates of homicide and suicide (6.2 per 100,000 and 6.1 per 100,000 respectively)
 - Suicide rates for 35-44 year olds (11.6 per 100,000) were over 4 times the homicide rate for that age group (2.6 per 100,000).
 - Suicide rates for residents 85 years and older were 14 times higher than homicide rates for that age group.
- Suicide rates were consistently higher than homicide rates for every age group 20-24 years and older.

Injury Death Rates for Suicide—by Sex and Age Group

Massachusetts Residents, 1995-1999

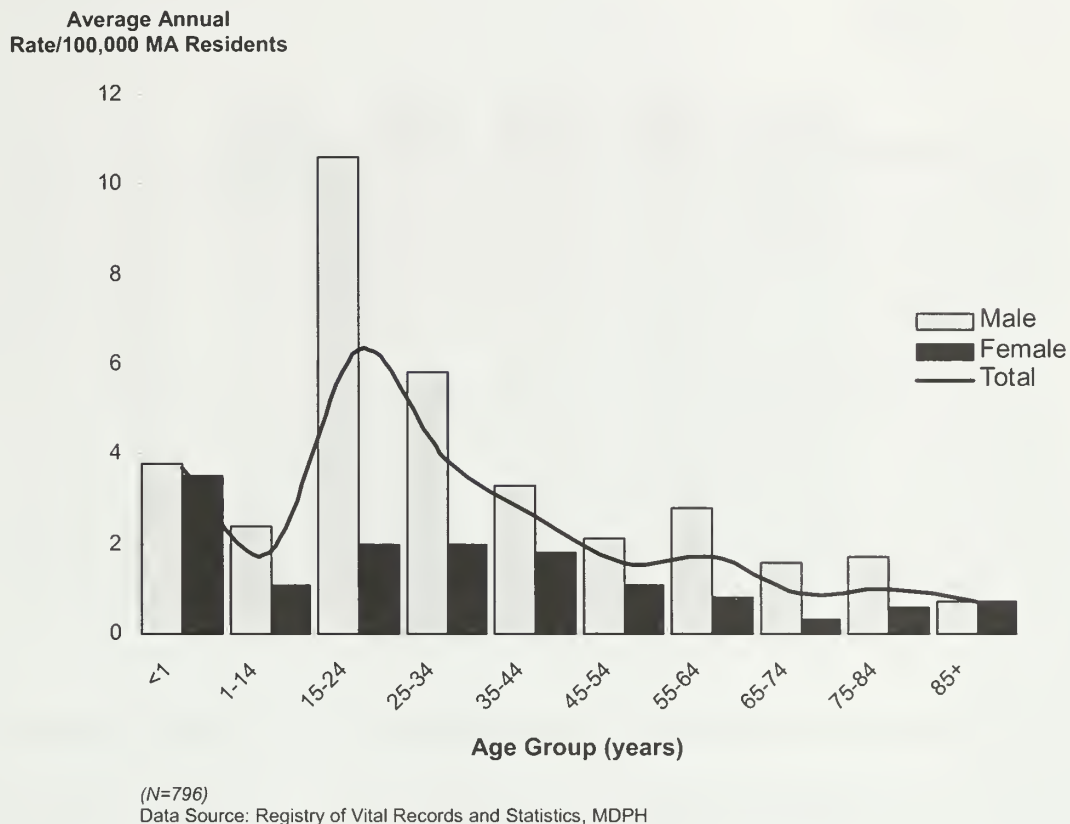


(N=2,393)
Data Source: Registry of Vital Records and Statistics, MDPH
Note: age groups under 10 are not reported.

Between 1995 and 1999:

- Males had an overall suicide rate nearly 4 times higher than females: 12.3 per 100,000 among males, compared to 3.3 per 100,000 females.
- For males, the highest rate for suicide was among people ages 85+ years. The leading cause of suicide death for males in this age group was firearms (n=24).
- For females, the highest rate for suicide was among people ages 35-44 years. The leading cause of suicide death for females in this age group was poisonings (n=75).
- The leading cause of suicide among males in Massachusetts was suffocation/hanging and among females the leading cause was poisoning. Nationally, the leading cause of suicide among males and females was firearms.

Injury Death Rates for Homicide—by Sex and Age Group Massachusetts Residents, 1995-1999



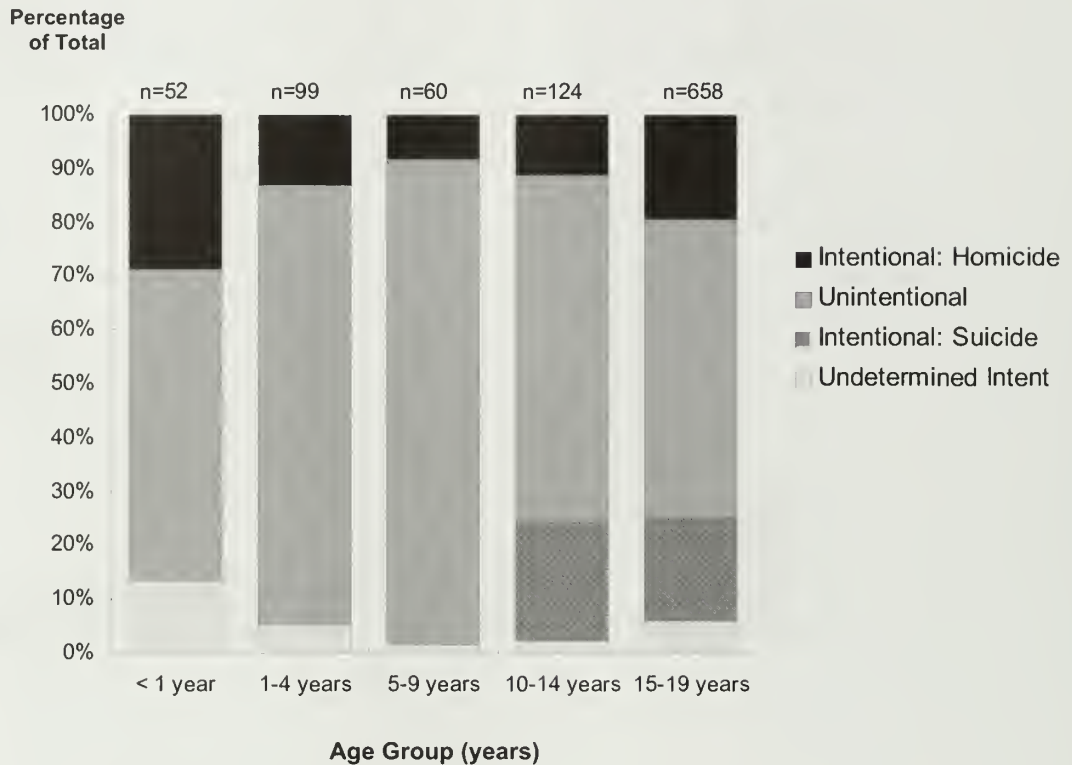
Between 1995 and 1999:

- Males had comparably higher rates of homicide than females.
- For males, the highest rate for homicide was among 15-24 year olds (10.6 per 100,000). The leading cause of homicide for males in this age group was firearms (n=167).
- For females, the highest rate for homicide was among individuals under 1 year of age.*

* Statistically significant for years 1990-1999 ($p < .001$).

Injury Deaths—by Intent and Age Group (Ages 0-19)

Massachusetts Residents, 1995-1999



(N=993)

Data Source: Registry of Vital Records and Statistics, MDPH

Between 1995 and 1999:

- The majority (62%) of injury deaths among children ages 0-19 years were unintentional.
- Homicides were responsible for almost 30% of the injury fatalities among children under 1 year.
- Children 10-14 years had almost twice the number of suicides compared with homicides (27 and 14 respectively).
- Adolescents ages 15-19 years, experienced relatively equal numbers of suicides and homicides (125 and 128 respectively).

Section II: Injury-related Hospital Discharges

Injury-related hospital discharge data was obtained from the MA Hospital Discharge Database, MA Division of Health Care Finance and Policy.

For the purposes of this report, an injury-related hospital discharge was defined as any case, which was assigned an ICD-9-CM diagnosis code ranging from 800-999. Hospitalizations due to certain adverse effects, such as complications of medical or surgical care (995.0-995.4, 995.6, 995.7, 995.86, 995.89, and 996-999), and the late effects of injuries (905-909) were excluded if they lacked another valid injury code.

The primary E Code (External Cause of Injury Code) field was used to categorize the cause and intent of the injury.

Persons who died while in the hospital and those who transferred to another acute care facility were excluded from the hospital discharge analyses.

Hospital discharge data are based on a fiscal year (October 1 – September 30).

Summary of Injury-related Hospital Discharges—1995-1999

Cause by Intent

Massachusetts Residents

- Between 1995 and 1999 there were 223,915 injury-related hospitalizations to Massachusetts residents.
- The average annual injury-related hospitalization rate was 721 per 100,000 residents.

Cause Categories:	INJURY INTENT					Total	Average Annual Rate/ 100,000
	Uninten- tional	Intentional		Undeter- mined	Other		
		Suicide	Homicide				
Cut/pierce	3,428	1,963	1,826	121	2	7,340	23.6
Drowning/submersion	172	7	0	4	-	183	0.6
Fall	109,638	133	20	103	-	109,894	353.8
Fire/burn	2,575	122	20	32	-	2,749	8.9
<i>Fire/Flame</i>	974	107	10	28	-	1,119	3.6
<i>Hot object/substance</i>	1,601	15	10	4	-	1,630	5.2
Firearm	488	59	587	157	10	1,301	4.2
Machinery	1,459	-	-	-	-	1,459	4.7
Natural/environmental	2,972	7	-	12	-	2,991	9.6
<i>Dog Bites</i>	688	-	-	-	-	688	2.2
<i>Other Bites/Stings</i>	1,548	-	-	-	-	1,548	5.0
<i>Other natural/environmental</i>	736	7	-	12	-	755	2.4
Non-powder gun (BB, pellet)	5	3	1	0	-	9	*
Overexertion	5,248	-	-	-	-	5,248	16.9
Poisoning	6,634	13,937	12	1,676	0	22,259	71.7
Struck by, against	5,315	-	2,759	-	28	8,102	26.1
Suffocation/hanging	1,224	88	5	4	-	1,321	4.3
Transport Injuries	25,846	26	3	4	-	25,879	83.3
Motor vehicle traffic	21,750	26	3	4	-	21,783	70.1
<i>Occupant</i>	14,545	-	-	-	-	14,545	46.8
<i>Motorcyclist</i>	1,906	-	-	-	-	1,906	6.1
<i>Pedal Cyclist</i>	749	-	-	-	-	749	2.4
<i>Pedestrian</i>	3,534	-	-	-	-	3,534	11.4
<i>Unspecified</i>	773	-	-	-	-	773	2.5
<i>Other</i>	243	-	-	-	-	243	0.8
Pedal cyclist, other	1,772	-	-	-	-	1,772	5.7
Pedestrian, other	293	-	-	-	-	293	0.9
Transport, other	2,031	-	-	-	-	2,031	6.5
Other specified--classifiable	3,055	30	415	6	5	3,511	11.3
<i>Battering/maltreatment**</i>	-	-	369	-	-	369	1.2
<i>Caught By/Between</i>	531	-	-	-	-	531	1.7
<i>Foreign Body</i>	1,801	-	-	-	-	1,801	5.8
<i>Other</i>	723	30	46	6	5	810	2.6
Other specified--not classifiable	999	150	443	56	2	1,650	5.3
Unspecified	8,561	121	677	330	5	9,694	31.2
No cause/intent assigned	-	-	-	-	-	20,325	65.4
TOTALS	177,619	16,646	6,768	2,505	52	223,915	721.0

(N=223,915)

Data Source: Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy.

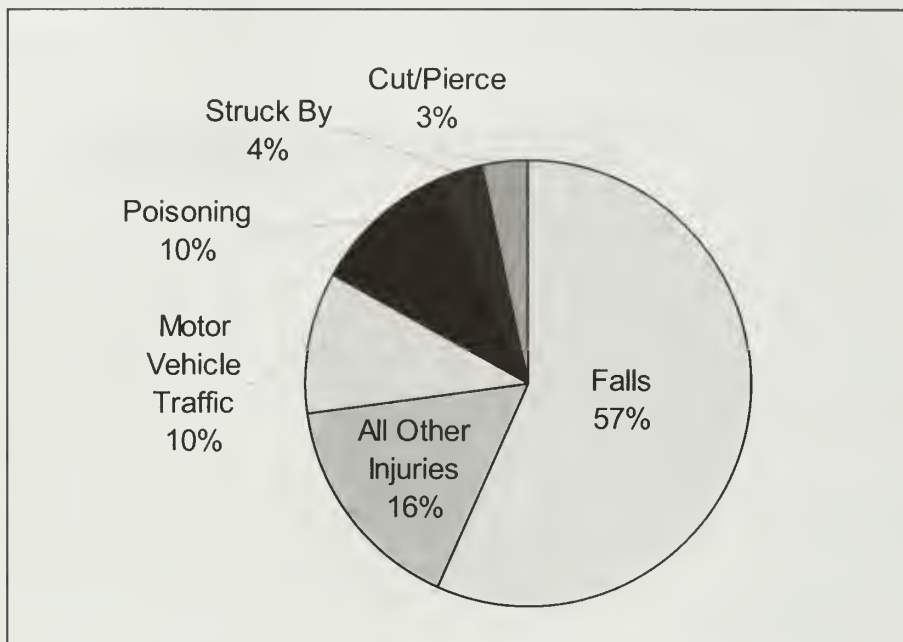
Please note that only one external cause of injury code (E Code) per discharge is included in these data. Refer to *Notes and Methodology* section for additional information.

*Rates that are based on frequencies less than 20 may be unstable and are therefore not routinely reported.

**This classification captures only child and adult abuse cases that identify a perpetrator. These numbers are considered an underestimate.

Injury-related Hospital Discharges—Leading Causes in 1999

Massachusetts Residents, 1999



(N=44,337)

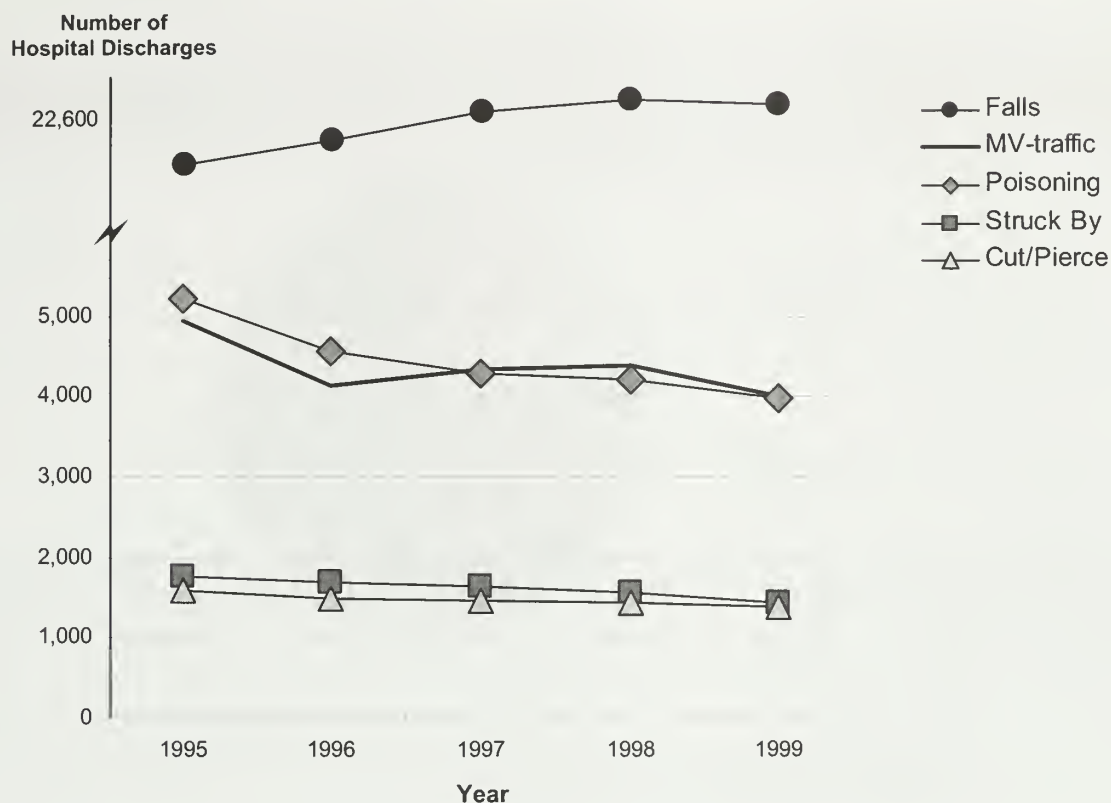
Data Source: Massachusetts Hospital Discharge Database,
MA Division of Health Care Finance and Policy

In 1999:

- The five leading causes of injury-related hospital discharges to Massachusetts residents were: falls (n=22,553), motor-vehicle traffic (n=4,004), poisonings, struck by/against, and cut/pierce.
- 62% of fall-related hospital discharges were due to a fall on the same level (by tripping or slipping).
- Among poisoning-related hospitalizations, 61% were self-inflicted.
- 67% of motor vehicle traffic-related injuries were to occupants (drivers and passengers), 16% were to pedestrians.
- 26% of struck by/against injury-related hospitalizations were due to physical fights and 22% were sports-related.
- Among cut/pierce injury-related hospitalizations, 43% were unintentional, 32% were self-inflicted, and 24% were assault-related.

Injury-related Hospital Discharges—Leading Causes by Year

Massachusetts Residents, 1995-1999



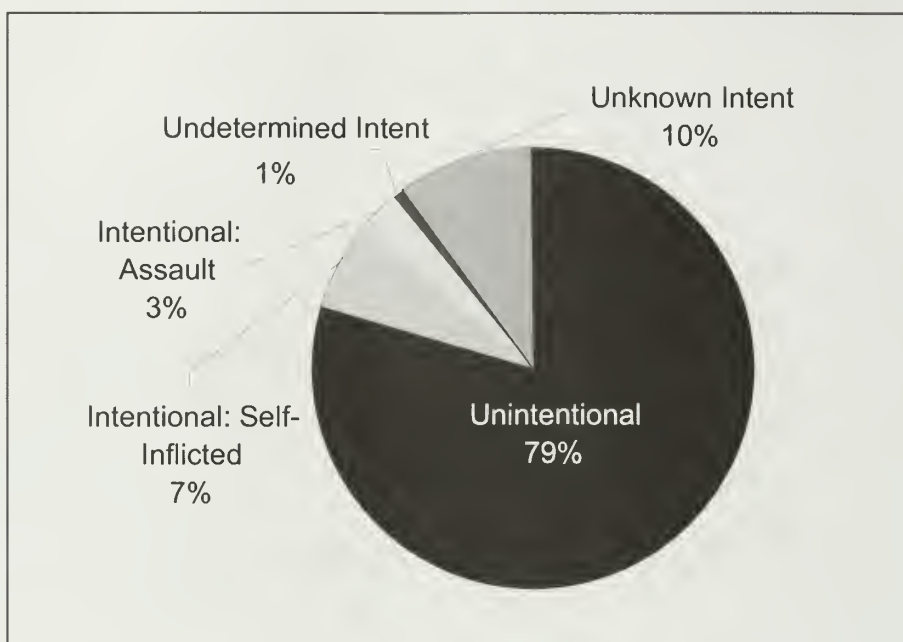
(N=223,915)
Please note change of scale on the vertical axis.
Data Source: Massachusetts Hospital Discharge Database,
MA Division of Health Care Finance and Policy.

Between 1995 and 1999:

- Fall-related hospitalizations greatly outnumbered injury hospitalizations from all other leading causes, for all years studied. Falls (n=109,894) accounted for nearly twice the number of injury-related hospitalizations than the next four leading causes combined (n=59,484).
- Fall-related hospitalizations increased 8% from 1995 (n=20,831) to 1999 (n=22,553).
- Other leading causes of hospitalizations decreased: poisonings by 23% (from 5,211 to 3,990), motor vehicle-related traffic injuries by 19%, struck by/against injuries by 19% and cut/pierce injuries by 12%.

Injury-related Hospital Discharges—Intent of Injury in 1999

Massachusetts Residents



(N=44,337)

Data Source: Massachusetts Hospital Discharge Database,
MA Division of Health Care Finance and Policy.

In 1999:

- There were 44,337 injury-related cases discharged from acute care hospitals in Massachusetts.
- Of these discharges, 79% were due to unintentional injuries, 10% were for intentional injuries and 1% were for injuries of undetermined intent. Ten percent of injury-related discharges did not have an external cause of injury code assigned (unknown intent).
- There were 4,252 intentional injury cases discharged from acute care hospitals. Of these, 70.1% were self-inflicted and 29.9% were assaults.

Injury-related Hospital Discharges— Leading Causes by Intent in 1999

Massachusetts Residents

Unintentional		Intentional: Self-Inflicted		Intentional: Assault		Undetermined Intent	
Fall 22,516		Poisoning 2,416		Struck by/against 491		Poisoning 304	
MV Traffic-related 3,995		Cut/pierce 439		Cut/pierce 329		Firearm 28	
Poisoning 1,267		Suffocation 19		Firearm 122		Fall 17	
All Others 7,450		All Others 108		All Others 328		All Others 57	
Total	Rate*	Total	Rate*	Total	Rate*	Total	Rate*
35,228	560.0	2,982	47.4	1,270	20.2	406	6.5

(N=44,337)

Data Source: Massachusetts Hospital Discharge Database,
MA Division of Health Care Finance and Policy.

"Other" intent which includes legal intervention and operations of war (n=11), and "Unknown" intent (n=4,440) are not included.

*Rates are per 100,000 residents.

In 1999:

- Falls were the overwhelming cause of injury-related hospitalized cases, accounting for over 50% of the total in 1999. Sixty-eight percent of infants less than one year of age who were hospitalized for a fall injury suffered a traumatic brain injury.
- Poisonings were the leading cause of hospitalized self-inflicted injuries. Forty-three percent of these poisonings were due to the use of tranquilizers or other psychotropic agents.
- Struck by/against injuries were the leading cause of assault-related hospital discharges. Seventy-five percent of these involved an unarmed fight or brawl and 25% involved the use of a blunt or thrown object.

Charges for Injury-related Hospital Discharges— Intent by Cause

Massachusetts Residents, 1999

- Total injury-related hospitalization charges in 1999 exceeded \$575 million.

Rank	Intent & Cause	Estimated Number	% of All Injuries	Rate/ 100,000	Mean Charge (in 1999) ¹
UNINTENTIONAL					
1	Fall	22,516	56.4%	357.9	\$12,259
2	Motor Vehicle Traffic	3,995	10.0%	63.5	\$22,542
	<i>Occupant</i>	2,657	6.7%	42.2	\$21,303
	<i>Motorcyclist</i>	356	0.9%	5.7	\$29,509
	<i>Pedal Cyclist</i>	124	0.3%	2.0	\$20,625
	<i>Pedestrian</i>	655	1.6%	10.4	\$25,299
	<i>Unspecified</i>	163	0.4%	2.6	\$15,888
3	Unspecified	1,808	4.5%	28.7	\$11,314
4	Poisoning	1,267	3.2%	20.1	\$7,779
5	Struck by/ Against	934	2.3%	14.8	\$11,709
6	Overexertion	933	2.3%	14.8	\$8,798
7	Cut/pierce	594	1.5%	9.4	\$7,705
8	Natural/environmental	589	1.5%	9.4	\$6,589
	<i>Dog Bites</i>	128	0.3%	2.0	\$5,581
	<i>Other Bites/Stings</i>	296	0.7%	4.7	\$5,515
	<i>Other natural/environmental</i>	165	0.4%	2.6	\$9,299
9	Other specified & classifiable	504	1.3%	8.0	\$18,863
	<i>Caught by/between</i>	84	0.2%	1.3	\$10,042
	<i>Foreign Body</i>	300	0.8%	4.8	\$11,073
	<i>Other</i>	120	0.3%	1.9	\$44,511
10	Fire/burn	444	1.1%	7.1	\$21,603
11	Transport, other	386	1.0%	6.1	\$17,781
12	Other specified, not classifiable	304	0.8%	4.8	\$8,878
13	Pedal cyclist/other	294	0.7%	4.7	\$10,698
14	Suffocation	272	0.7%	4.3	\$17,248
15	Machinery	263	0.7%	4.2	\$17,351
16	Pedestrian, other	57	0.1%	0.9	\$18,752
17	Guns	45	0.1%	0.7	\$23,001
	<i>Firearm</i>	43	0.1%	0.7	\$18,136
	<i>Non-powder gun (e.g., airgun, BB)</i>	2	< .1%	--	\$1,865
18	Drowning/submersion	23	0.1%	0.4	\$19,098
ASSAULT					
1	Struck by/Against	491	1.2%	7.8	\$12,089
2	Cut/pierce	329	0.8%	5.2	\$15,977
3	Unspecified	129	0.3%	2.1	\$14,718
4	Guns: Firearm	122	0.3%	1.9	\$25,477
5	Other specified, not classifiable	97	0.2%	1.5	\$10,312
6	Other specified & classifiable	89	0.2%	1.4	\$9,773
	<i>Battering/maltreatment</i>	81	0.2%	1.3	\$10,105
	<i>Other</i>	8	< .1%	0.1	\$6,407
7	Fall	3	< .1%	--	\$33,149
7	Fire/burn	3	< .1%	--	\$39,069
7	Poisoning	3	< .1%	--	\$2,382
8	Motor vehicle traffic	2	< .1%	--	\$8,238
9	Suffocation	1	< .1%	--	\$13,511

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Charges for Injury-related Hospital Discharges— Intent by Cause Massachusetts Residents, 1999

Rank	Intent & Cause	Estimated Number	% of All Injuries	Rate/100,000	Mean Charge (in 1999) ¹
SELF-INFLICTED					
1	Poisoning	2,416	6.1%	38.4	\$5,984
2	Cut/pierce	439	1.1%	7.0	\$8,175
3	Other specified, not classifiable	33	0.1%	0.5	\$13,645
4	Fire/burn	21	0.1%	0.3	\$65,903
5	Suffocation/Hanging	19	< .1%	0.3	\$8,023
6	Fall	17	< .1%	0.3	\$26,984
7	Unspecified	14	< .1%	0.2	\$9,308
8	Guns	9	< .1%	0.1	\$72,863
	Firearm	8	< .1%	0.1	\$81,629
	Non-powder gun (e.g., airgun, BB)	1	< .1%	--	\$2,732
9	Other specified & classifiable	6	< .1%	0.1	\$109,374
9	Motor Vehicle Traffic	6	< .1%	0.1	\$13,595
10	Drowning/submersion	1	< .1%	--	\$7,289
10	Natural/environmental	1	< .1%	--	\$8,364
UNDETERMINED					
1	Poisoning	304	0.8%	4.8	\$7,972
2	Guns: Firearm	28	0.1%	0.4	\$20,592
3	Unspecified	22	0.1%	0.3	\$10,727
4	Cut/pierce	22	0.1%	0.3	\$7,310
5	Fall	17	< .1%	0.3	\$21,349
6	Other specified, not classifiable	6	< .1%	0.1	\$15,578
7	Fire/burn	4	< .1%	--	\$7,184
8	Natural/environmental	2	< .1%	--	\$2,407
9	Motor Vehicle Traffic	1	< .1%	--	\$15,424
TOTALS by Intent of Injury					
	UNINTENTIONAL	35,228	88.3%	560.0	\$13,274
	ASSAULT	1,269	3.2%	20.2	\$14,431
	SELF-INFLICTED	2,982	7.5%	47.4	\$7,388
	UNDETERMINED	378	0.9%	6.0	\$9,611
	OTHER ²	11	< .1%	0.2	\$11,019
	Injuries with no charges listed	4,440	n/a	70.6	n/a
	No E-Codes Assigned	29	n/a	0.5	n/a
	TOTAL	44,337	100.0%	704.9	n/a

(N=44,337)

Data Source: Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy.

¹ Mean charges are based on total charges as reported by hospitals.

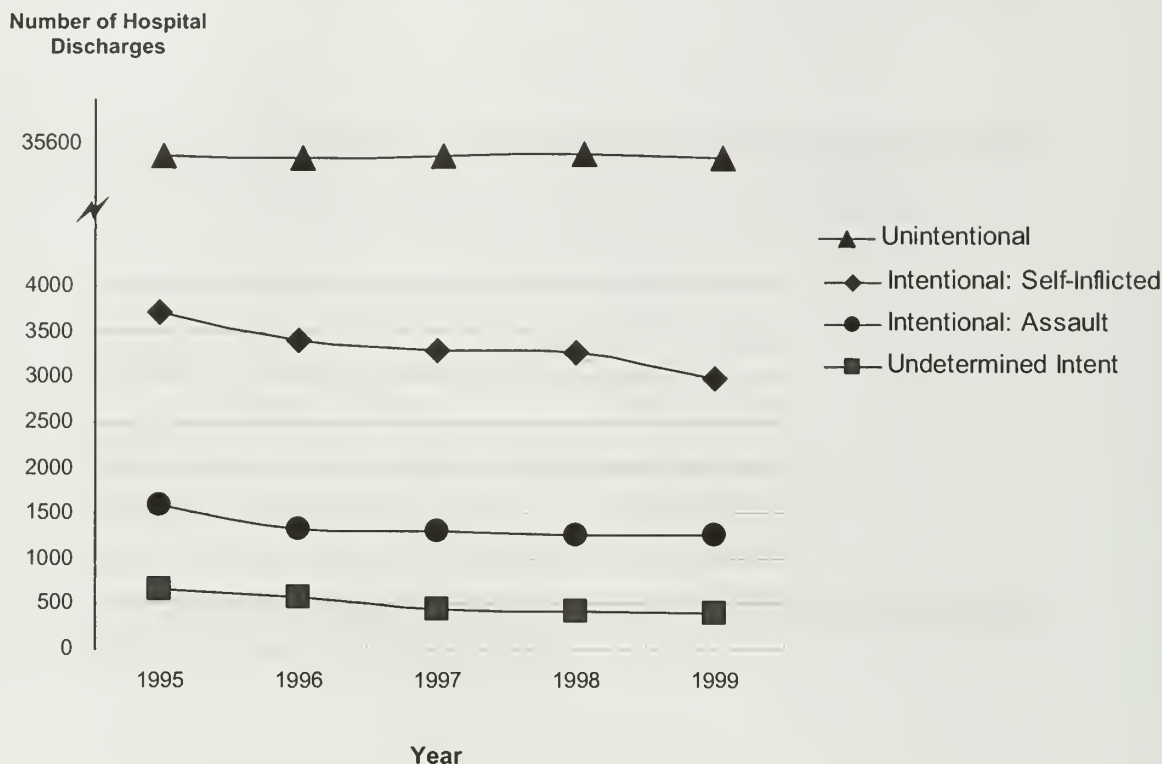
² Other intent includes legal intervention and operations of war.

In 1999:

- Gun-related injuries and motor vehicle traffic crashes were among the unintentional injuries with the highest charges. Motorcyclists had the highest mean charges (\$29,509) among motor vehicle traffic-related hospitalizations.
- Firearm and fire/burn injuries were among the most costly self-inflicted injury hospitalizations, with a mean charge of \$81,629 and \$65,903 respectively.

Injury-related Hospital Discharges—Intent of Injury by Year

Massachusetts Residents, 1995-1999



(N=223,915)

Please note scale change on vertical axis.

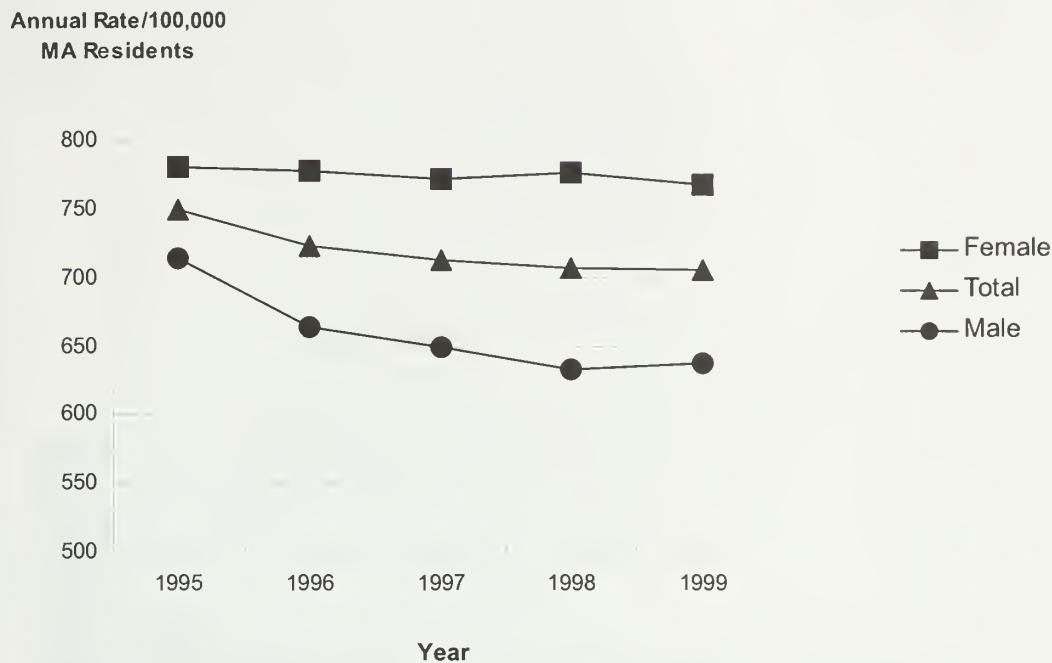
Data Source: Massachusetts Hospital Discharge Database,
MA Division of Health Care Finance and Policy.

Between 1995 and 1999:

- The number of unintentional injury-related hospitalizations was at least 6.7 times higher than intentional injuries for each year presented.
- Hospitalizations for self-inflicted injuries were consistently higher than those for assault-related injuries.
- Hospitalizations for self-inflicted injuries decreased 20% from 1995 (n=3,711) to 1999 (n=2,982).
- Assault-related hospitalizations decreased 21% from 1995 to 1999 (n=1,602 and n=1,270 respectively).

Injury-related Hospital Discharge Rates—by Sex and Year

Massachusetts Residents, 1995-1999

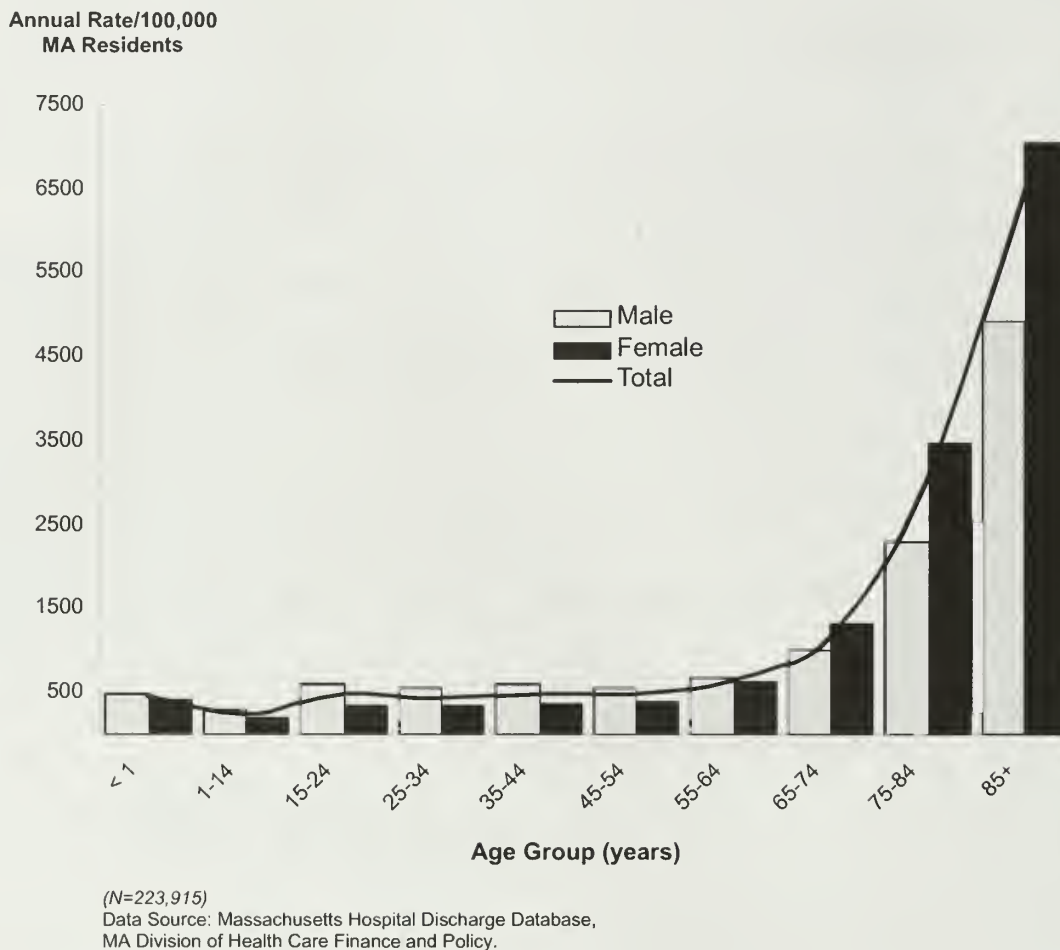


(N=223,915)
Data Source: Massachusetts Hospital Discharge Database,
MA Division of Health Care Finance and Policy.

Between 1995 and 1999:

- The total injury-related hospitalization rate declined approximately 6%.
- Females had higher overall rates of injury-related hospitalizations compared to males. This differs from the pattern seen in injury fatalities.
- Males experienced an 11% decline in injury-related hospital discharge rates while rates for females remained stable.

Injury-related Hospital Discharge Rates—by Sex and Age Group Massachusetts Residents, 1995-1999

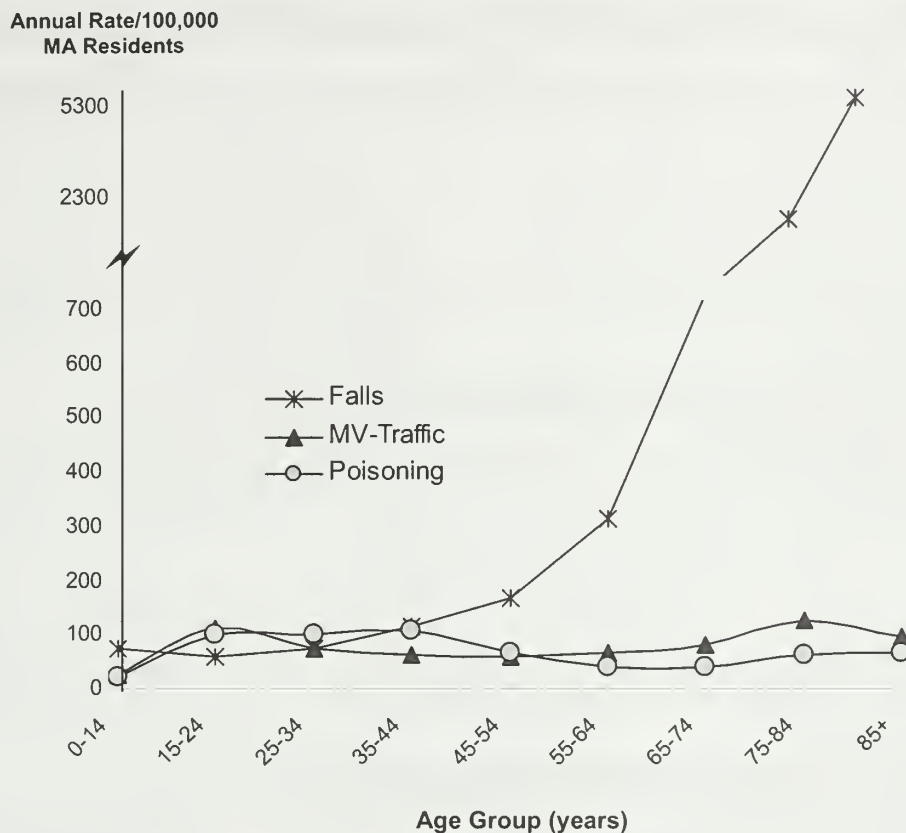


Between 1995 and 1999:

- Overall, hospital discharge rates for injury-related diagnoses showed little variation across the lifespan until the age of 65 years when injury-related hospitalization rates begin to rise exponentially.
- The rates of injury-related hospitalizations for persons ages 85 years and over were 1.6 times higher than those for persons ages 80-84, and 6.9 times higher than persons ages 65-69.

Injury-related Hospital Discharge Rates by Age Group for Fall, Motor Vehicle Traffic, and Poisoning Injuries

Massachusetts Residents, 1995-1999



(N=223,915)
Please note scale change on vertical axis.
Data Source: Massachusetts Hospital Discharge Database,
MA Division of Health Care Finance and Policy.

The leading causes of injury-related hospitalizations vary across the lifespan. Between 1995 and 1999:

- Falls were the leading cause of injury-related hospitalizations in the very young (0-14 years) as well as in the middle age and older populations.
- Motor vehicle-related traffic was the leading cause of injury-related hospitalizations for the 15-24 year age group.
- Poisoning was the leading cause of injury-related hospitalizations for the 25-34 year age group.

Injury-related Hospital Discharges— Leading Causes by Age Group Massachusetts Residents, 1995-1999

Children								
< 1 year			1-4 years			5-9 years		
Cause	number	percent	Cause	number	percent	Cause	number	percent
Fall	422	23.1	Fall	1,112	29.0	Fall	1,428	36.0
Other-classifiable	203	11.1	Poisoning	651	17.0	MV Traffic	555	14.0
Unspecified	141	7.7	Other-classifiable	346	9.0	Struck by/against	276	7.0
Suffocation	78	4.3	MV Traffic	296	7.7	Pedal cyclist	251	6.3
Poisoning	74	4.1	Nature/environment	220	5.7	Cut/pierce	230	5.8
Other Injuries	905	49.6	Other Injuries	1,215	31.6	Other Injuries	1,226	30.9
TOTAL	1,823	100.0	TOTAL	3,840	100.0	TOTAL	3,966	100.0
Average annual rate: 449.8 per 100,000			Average annual rate: 236.4 per 100,000			Average annual rate: 192.6 per 100,000		

Youth					
10-14 years			15-19 years		
Cause	number	percent	Cause	number	percent
Fall	1,467	26.6	MV Traffic	2,584	24.0
MV Traffic	755	13.7	Poisoning	2,360	21.9
Poisoning	622	11.3	Fall	1,368	12.7
Struck by/against	609	11.0	Struck by/against	1,050	9.8
Pedal cyclist	407	7.4	Cut/pierce	745	6.9
Other Injuries	1,653	30.0	Other Injuries	2,656	24.7
TOTAL	5,513	100.0	TOTAL	10,763	100.0
Average annual rate: 286.4 per 100,000			Average annual rate: 524.3 per 100,000		

Adult					
20-44 years			45-64 years		
Cause	number	percent	Cause	number	percent
Poisoning	12,526	22.1	Fall	14,153	41.4
Fall	10,900	19.2	MV Traffic	3,970	11.6
MV Traffic	9,442	16.6	Poisoning	3,710	10.9
Cut/pierce	4,417	7.8	Unspecified	2,054	6.0
Struck by/against	3,987	7.0	Struck by/against	1,113	3.3
Other Injuries	15,524	27.3	Other Injuries	9,175	26.8
TOTAL	56,796	100.0	TOTAL	34,175	100.0
Average annual rate: 454.1 per 100,000			Average annual rate: 537.4 per 100,000		

Older Adult					
65-74 years			75+ years		
Cause	number	percent	Cause	number	percent
Fall	15,958	61.9	Fall	63,076	77.6
MV Traffic	1,790	6.9	Unspecified	2,958	3.6
Unspecified	1,325	5.1	MV Traffic	2,369	2.9
Poisoning	914	3.5	Poisoning	1,299	1.6
Overexertion	621	2.4	Overexertion	928	1.1
Other Injuries	5,153	20.0	Other Injuries	10,637	13.1
TOTAL	25,761	100.0	TOTAL	81,267	100.0
Average annual rate: 1176.0 per 100,000			Average annual rate: 4032.2 per 100,000		

(N=223,904)

Data Source: Massachusetts Hospital Discharge Database,
MA Division of Health Care Finance and Policy.

- Children ages nine years and younger, had an average annual hospital discharge injury rate of 235.5 per 100,000.
- Youth between the ages of 10 and 19 had an average annual hospital discharge injury rate of 409.2 per 100,000.
- Adults 20 to 64 years of age had an average annual hospital discharge injury rate of 482.2 per 100,000.
- Older Adults, ages 65 and over, had an average annual hospital discharge injury rate of 2544.6 per 100,000; this was 5.3 times higher than the next leading age group.

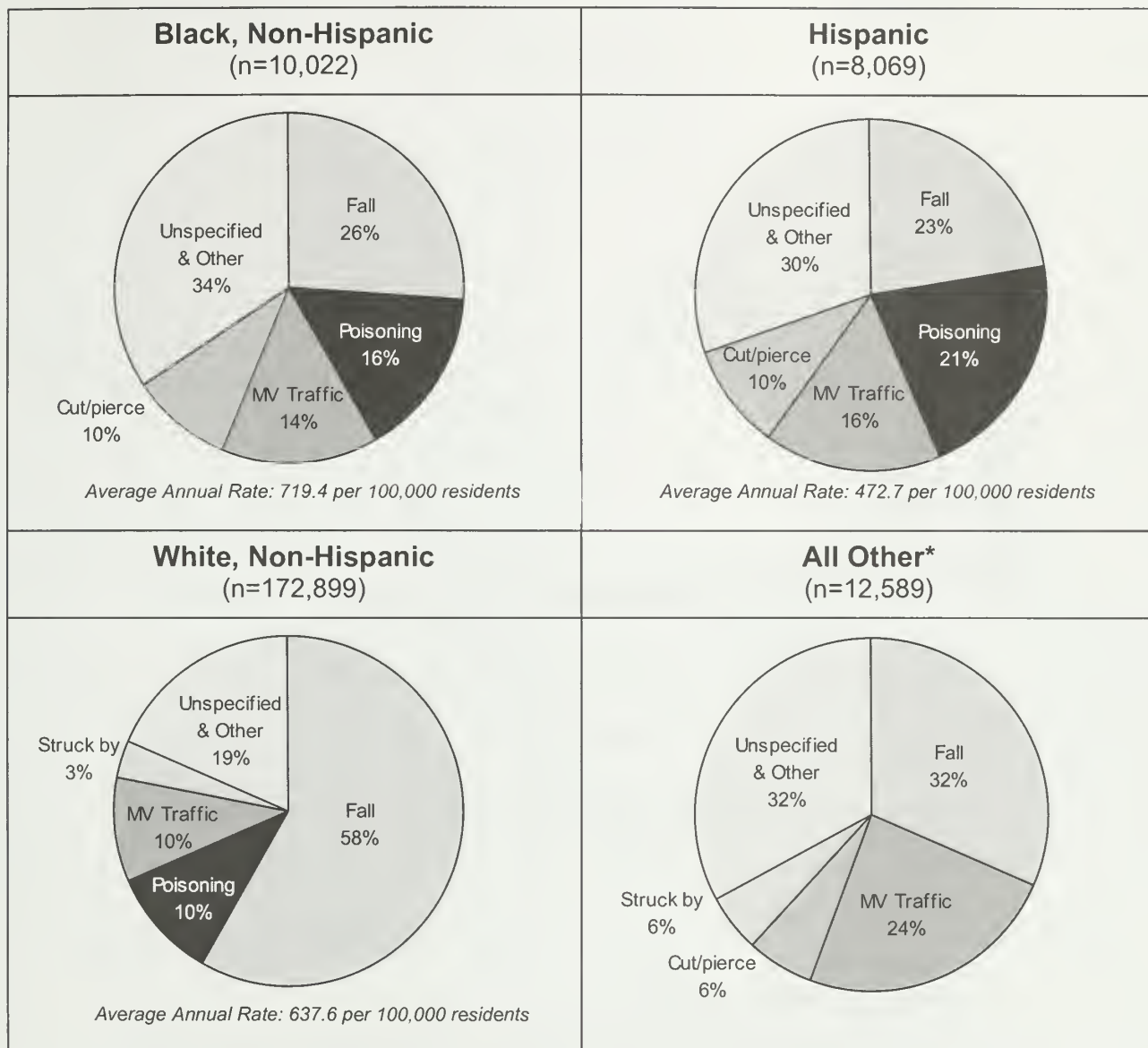
Selected definitions:

"Other-classifiable" includes categories such as caught by or between objects, foreign bodies, and maltreatment.

"Nature/environment" includes categories such as dog bites, stings, exposure to extreme cold or heat, electricity, and radiation.

"Overexertion" includes categories such as sprains.

Injury-related Hospital Discharges— Leading Causes by Race/Ethnicity Massachusetts Residents, 1995-1999



(N=203,579)

Data Source: Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy.

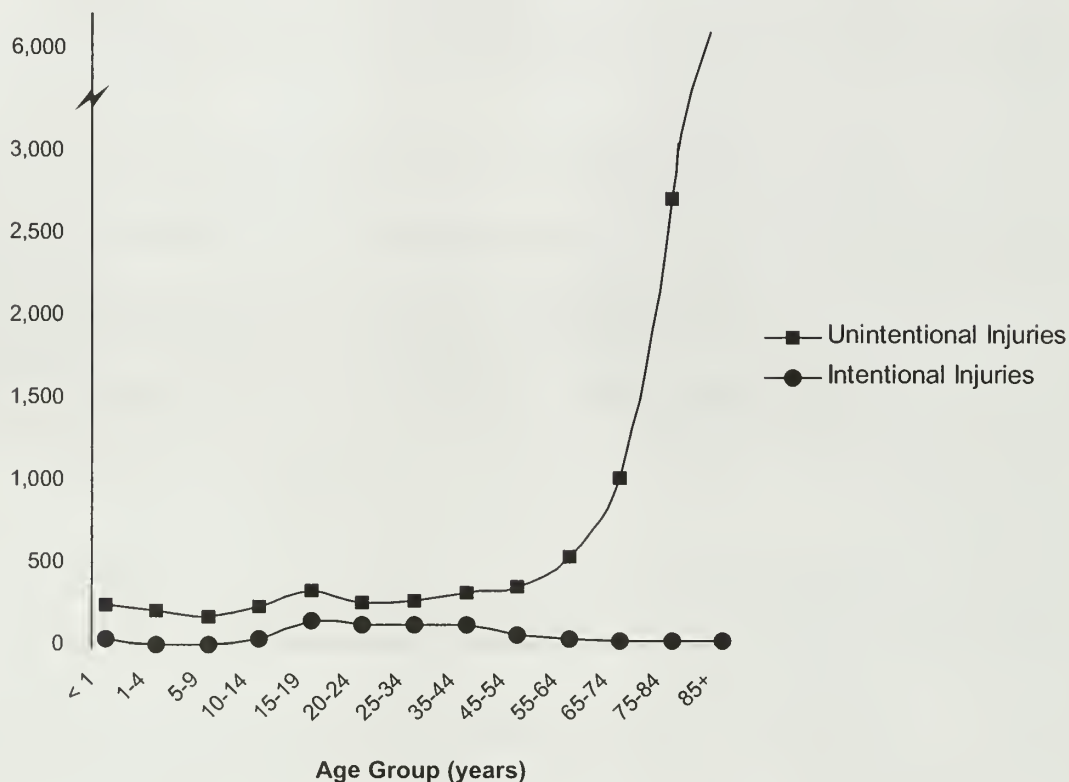
*"All Other" includes American Indian, Asian or Other Pacific Islander, other and unknown races.

Between 1995 and 1999:

- Hispanic residents had the lowest rates of injury-related hospitalizations with a rate 1.3 times less than white, non-Hispanic residents and 1.5 times less than black, non-Hispanic residents.
- Falls were responsible for proportionately more injury-related hospitalizations among white residents than among black and Hispanic residents.

Injury-related Hospital Discharge Rates—Intent by Age Group Massachusetts Residents, 1995-1999

Annual Rate/100,000
MA Residents



(N=201,040)

Please note scale change on vertical axis.

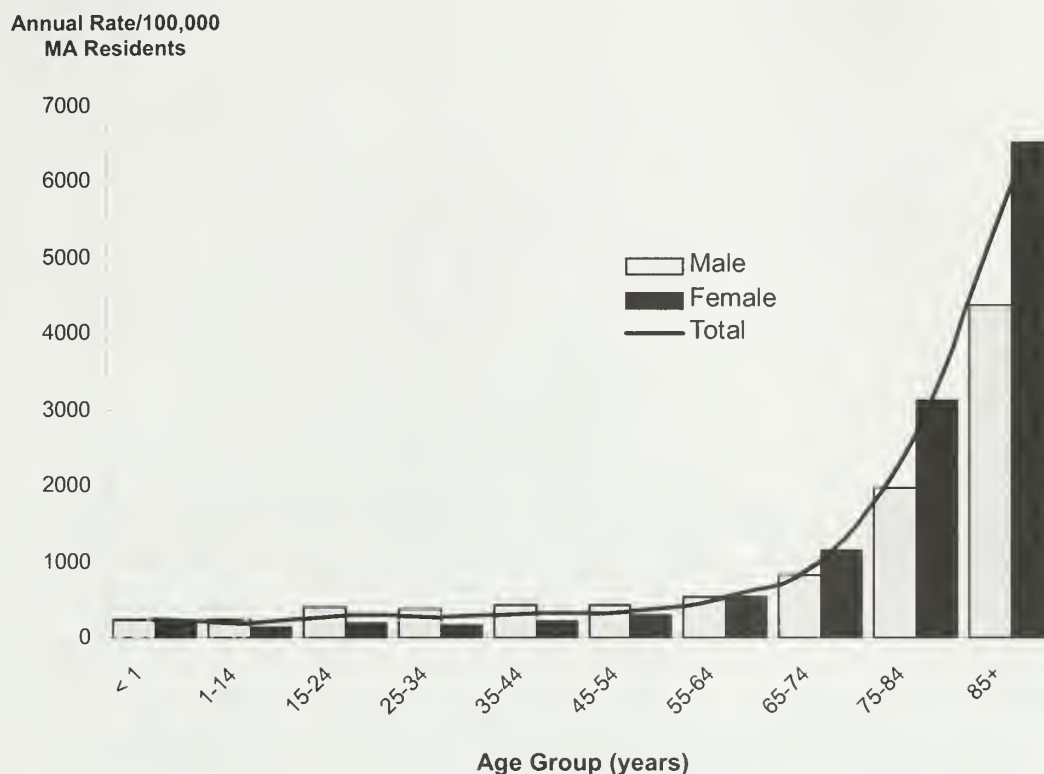
Data Source: Massachusetts Hospital Discharge Database,
MA Division of Health Care Finance and Policy.

Between 1995 and 1999:

- Unintentional and intentional injury hospitalization rates closely paralleled each other from childhood through age 44 at which point unintentional injuries rose dramatically and intentional injuries declined.
- Hospitalization rates due to intentional injuries peaked at 15-19 years.
- 74% of the hospitalized injuries to residents 65 and older were due to falls.

Hospital Discharge Rates for Unintentional Injuries— by Sex and Age Group

Massachusetts Residents, 1995-1999

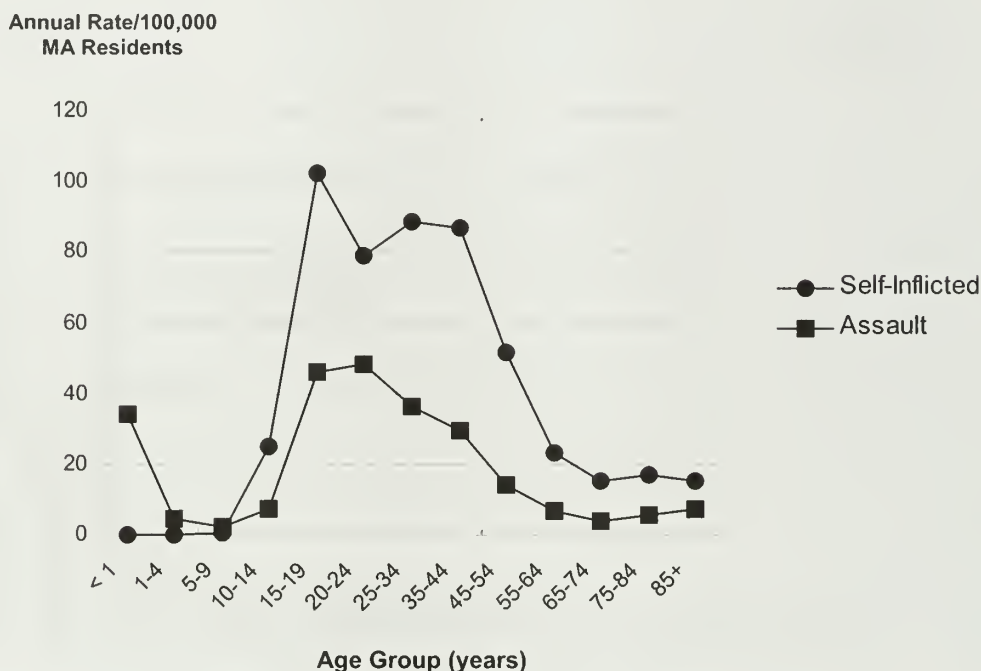


(N=177,611)
Data Source: Massachusetts Hospital Discharge Database,
MA Division of Health Care Finance and Policy.

Between 1995 and 1999:

- Injury-related hospitalization rates among males were higher than females until the age of 65 at which point females had higher rates.
- Under the age of 65 years, the total injury-related hospitalization rate among males was 521.8 per 100,000, compared to females who had a rate of 347.1 per 100,000.
- Over the age of 65 years, the total injury-related hospitalization rate among females was 3037.7 per 100,000, compared to males who had a rate of 1777.0 per 100,000.
- The highest injury-related hospitalization rates were among females ages 85 and older (7076.7 per 100,000).

Injury-related Hospital Discharge Rates— Self-inflicted and Assault-related Injuries by Age Group Massachusetts Residents, 1995-1999



(N=23,415)

Data Source: Massachusetts Hospital Discharge Database,
MA Division of Health Care Finance and Policy.

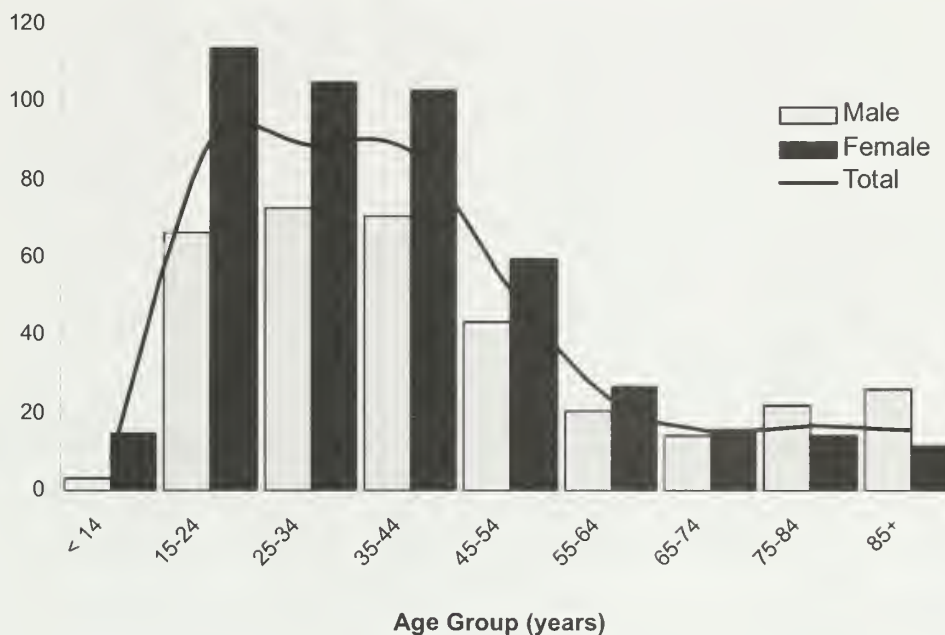
Between 1995 and 1999:

- Hospitalization rates for assault and self-inflicted injuries were highest for individuals in age groups 15-44 years. Struck by/against injuries were the leading cause of assault-related hospitalizations for this age group; poisonings were the leading cause of self-inflicted injury hospitalizations.
- Hospitalization rates for self-inflicted injuries were much higher than those for assault-related injuries for all age groups 10 years of age and older.

Hospital Discharge Rates for Self-Inflicted Injuries— by Sex and Age Group

Massachusetts Residents, 1995-1999

Annual Rate/100,000
MA Residents



(N=16,645)

Data Source: Massachusetts Hospital Discharge Database,
MA Division of Health Care Finance and Policy.

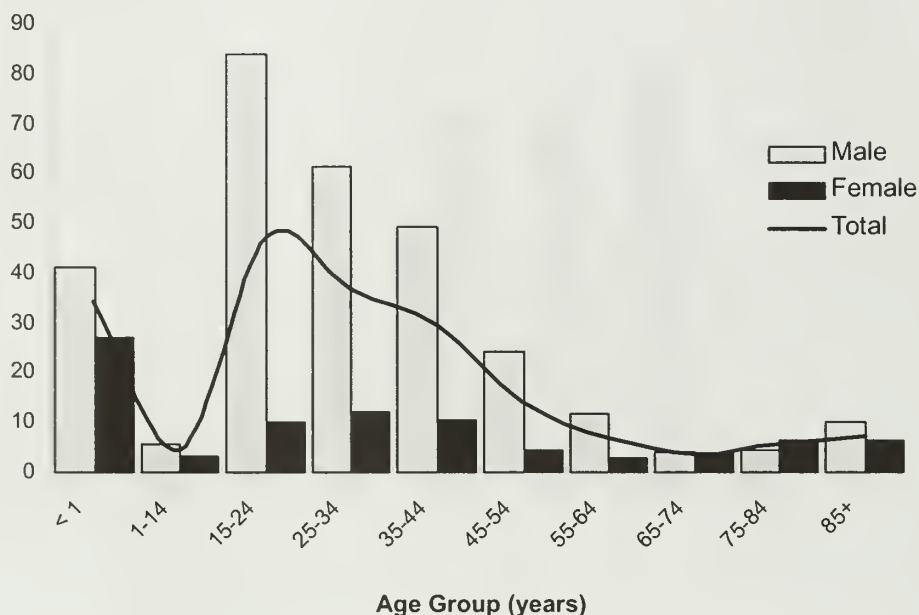
Between 1995 and 1999:

- Hospitalization rates for self-inflicted injuries peaked for age groups between 15 and 44 years, with females experiencing the highest rates between 15-24 years and males experiencing the highest rates between 25-34 years.
- Hospitalizations for self-inflicted injuries were higher for females compared with males until the age of 75 years and older, at which point males experienced higher rates. This contrasts with the pattern seen in suicide deaths where males were at greatest risk for all age groups.

Hospital Discharge Rates for Assault-related Injuries— by Sex and Age Group

Massachusetts Residents, 1995-1999

Annual Rate/100,000
MA Residents



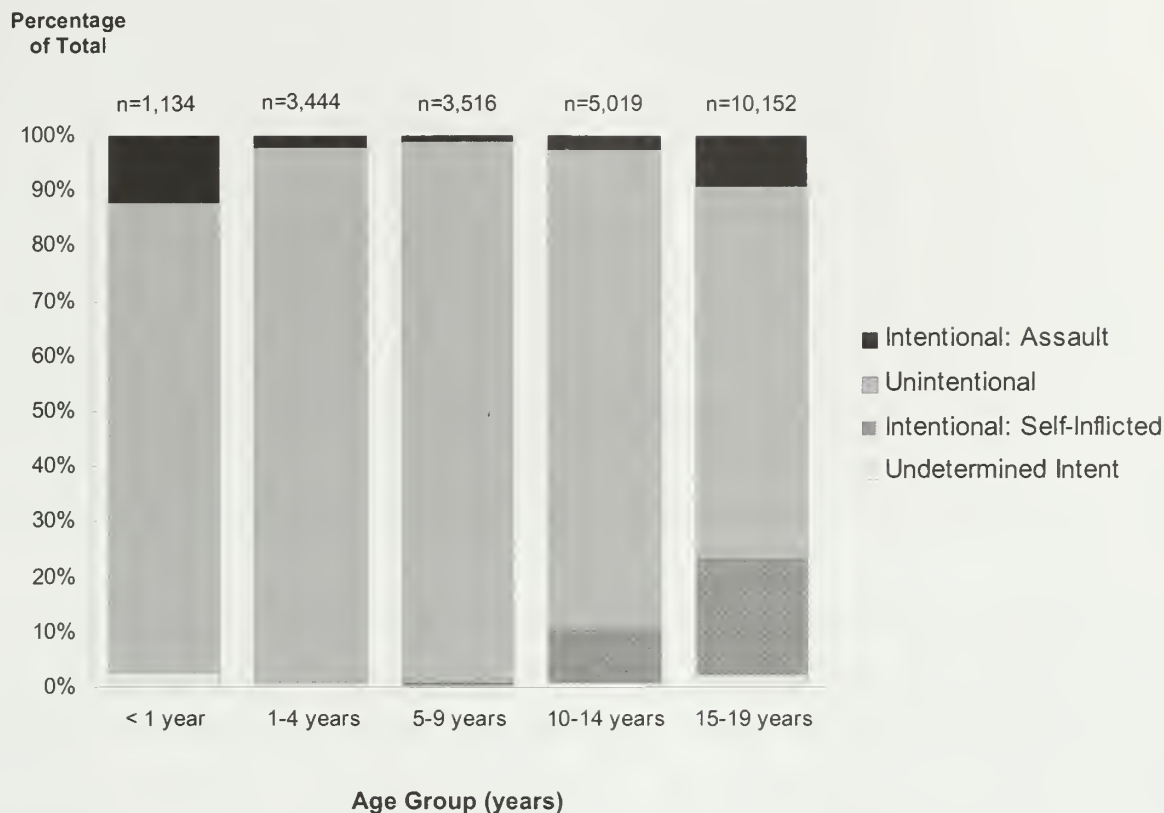
(N=6,770)

Data Source: Massachusetts Hospital Discharge Database,
MA Division of Health Care Finance and Policy.

Between 1995 and 1999:

- For females, assault-related hospitalization rates were highest in the under 1 year population; rates for this age group were 2.3 times higher than the next leading age group (25-34 years).
- For males, assault-related hospitalization rates were highest for individuals in the 15-24 year age group.
- Males had higher assault-related hospitalization rates than females at all ages, except in the 75-84 year age group.
- Hospitalization rates for assault-related injuries to the under 1 year population were 7.6 times higher than for children 1-14 years.

Injury-related Hospital Discharges— by Intent and Age Group (Ages 0-19) Massachusetts Residents, 1995-1999



(N=23,265)
Data Source: Massachusetts Hospital Discharge Database,
MA Division of Health Care Finance and Policy.

Between 1995 and 1999:

- The majority (82%) of injury-related hospitalizations among children less than 19 years were related to an unintentional event.
- Approximately 12% of the injury-related hospitalizations among children less than 1 year of age were due to an intentional event.
- Approximately 10% of the injury-related hospitalizations among children ages 10-14, and 21% among 15-19 year olds were self-inflicted.
- Self-inflicted injury-related hospitalizations outnumbered assault-related hospitalizations 3:1 in children ages 10-14, and 2:1 in youth ages 15-19.

Section III:

Estimated Injury-related Emergency Department Discharges

Data on injury-related emergency department discharges was obtained from the Emergency Department Injury Surveillance System (EDISS), MA Department of Public Health.

For the purposes of this report, an injury-related emergency department (ED) discharge was defined as any case, which was assigned an ICD-9-CM diagnosis code ranging from 800-999. ED discharges due to certain adverse effects, such as complications of medical or surgical care (995.0-995.4, 995.6, 995.7, 995.86, 995.89, and 996-999), and the late effects of injuries (905-909) were excluded if they lacked another valid injury code.

The primary E Code (External Cause of Injury Code) field was used to categorize the cause and intent of these injury cases.

Statewide estimates provided here are based on a sample of 12 hospital emergency departments that participate in EDISS.

Persons who died during treatment and those who were subsequently admitted to the hospital were excluded from the emergency department analyses.

Emergency department discharge data are based on a fiscal year (October 1 – September 30).

Summary of Estimated⁺ Injury-related ED Discharges—1999

Cause by Intent

Massachusetts Residents

- In 1999 there were an estimated 737,976 injury-related discharges treated and released in Massachusetts emergency departments.
- The estimated rate for injury-related ED discharges was 11,730 per 100,000 residents.

Cause Categories	INJURY INTENT					Total	Rate/ 100,000
	Uninten- tional	Intentional		Undeter- mined	Other*		
		Self-inflicted	Assault				
Cut/pierce	87,123	1,656	981	98	0	89,858	1,428.3
Drowning/submersion	121	6	0	6	-	133	2.1
Fall	180,829	46	17	58	-	180,950	2,876.2
Fire/burn	12,340	29	52	29	-	12,450	197.9
<i>Fire/Flame</i>	1,846	29	29	23	-	1,927	30.6
<i>Hot object/substance</i>	10,494	0	23	6	-	10,523	167.3
Firearm	104	17	52	52	12	237	3.8
Machinery	4,725	-	-	-	-	4,725	75.1
Natural/environmental	30,109	6	-	17	-	30,132	478.9
<i>Dog bites</i>	9,975	-	-	-	-	9,975	158.6
<i>Other bites/stings</i>	19,003	-	-	-	-	19,003	302.1
<i>Other natural/environmental</i>	1,131	6	-	17	-	1,154	18.3
Non-powder guns (BB, pellet)	92	0	12	17	-	121	1.9
Overexertion	85,000	-	-	-	-	85,000	1,351.1
Poisoning	6,859	5,042	12	1,292	0	13,205	209.9
Struck by, against	104,609	-	11,844	-	237	116,690	1,854.8
Suffocation/hanging/strangulation	756	69	46	12	-	883	14.0
Transport Injuries	105,716	0	23	29	-	105,768	1,681.2
Motor vehicle traffic	89,125	-	-	-	-	89,125	1,416.6
<i>Occupant</i>	77,778	-	-	-	-	77,778	1,236.3
<i>Motorcyclist</i>	2,354	-	-	-	-	2,354	37.4
<i>Pedal Cyclist</i>	1,240	-	-	-	-	1,240	19.7
<i>Pedestrian</i>	3,011	-	-	-	-	3,011	47.9
<i>Unspecified</i>	4,286	-	-	-	-	4,286	68.1
<i>Other</i>	456	-	-	-	-	456	7.2
Pedal cyclist, other	11,676	-	-	-	-	11,676	185.6
Pedestrian, other	369	-	-	-	-	369	5.9
Transport, other	4,546	-	-	-	-	4,546	72.3
Other specified--classifiable	36,033	12	2,071	0	0	38,116	605.9
<i>Battering/maltreatment**</i>	-	-	1,956	-	-	1,956	31.1
<i>Caught By/Between</i>	15,778	-	-	-	-	15,778	250.8
<i>Foreign Body</i>	18,743	-	-	-	-	18,743	297.9
<i>Other</i>	1,512	12	115	0	0	1,639	26.1
Other specified--not classifiable	6,167	542	4,886	46	6	11,647	185.1
Unspecified	34,620	35	1,408	104	69	36,236	576.0
No external injury cause assigned	-	-	-	-	-	11,842	188.2
TOTALS	695,203	7,460	21,404	1,743	324	737,976	11,730.2

(N=737,976)

Data Source: Emergency Department Injury Surveillance System, MDPH.

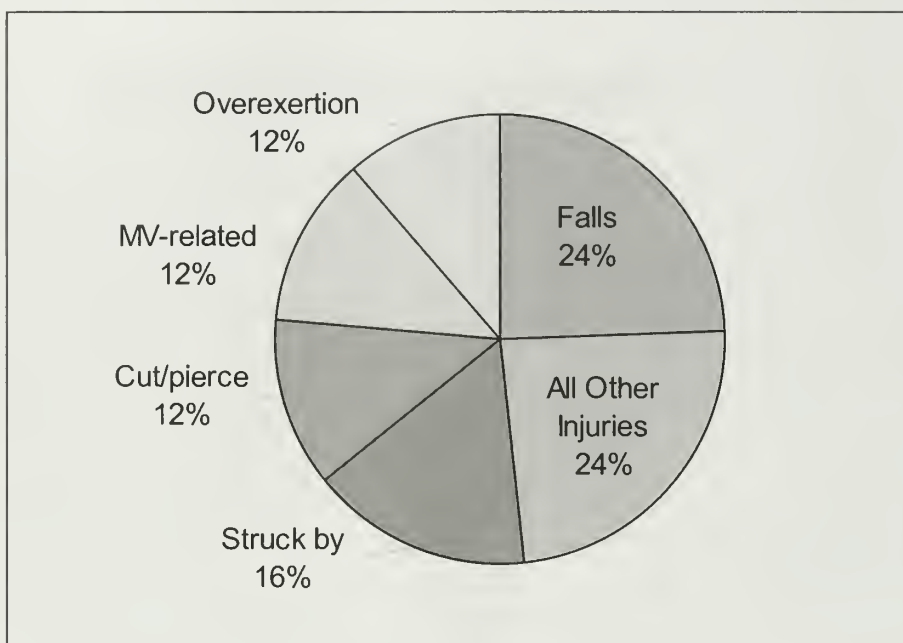
*Statewide estimates are based on data submitted to the Massachusetts Department of Public Health from a random sample of 12 hospital emergency departments.

**Other* intent includes legal intervention and operations of war.

**This classification captures only child and adult abuse cases in which a perpetrator is identified. These numbers are considered an underestimate.

Estimated Injury-related ED Discharges— Leading Causes in 1999

Massachusetts Residents



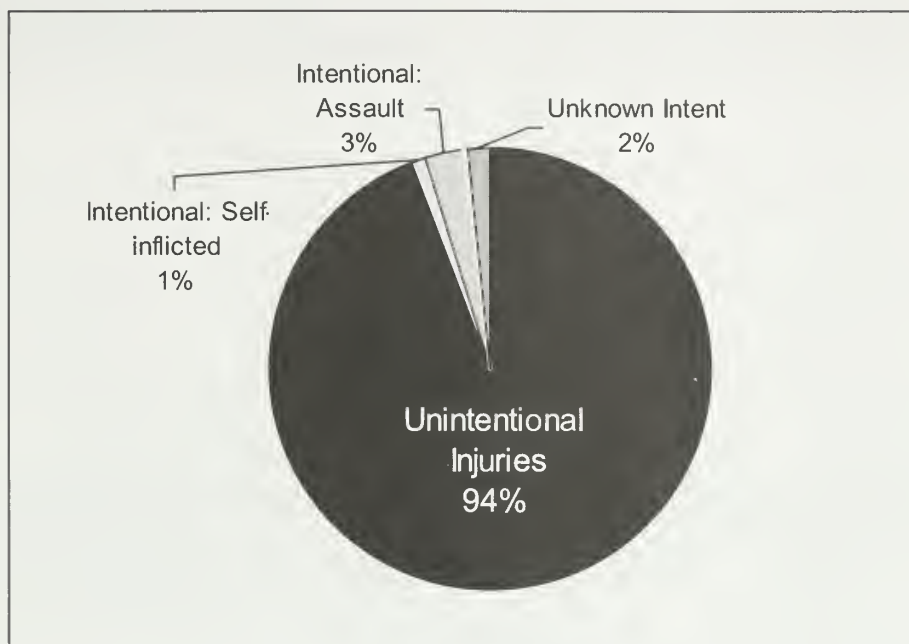
(N=737,976)

Data Source: Emergency Department Injury Surveillance System, MDPH.

In 1999:

- Overall, falls (n=180,950) were the leading cause of injury-related emergency department discharges, accounting for an estimated 24% of these cases. The majority of these falls (67%) occurred among children under the age of 14 and among adults 45 and over.
- Struck-by/against injuries were the leading cause of ED discharges among youth ages 15-19 (n=15,968) and the second leading cause overall.
- Motor vehicle-related traffic injuries were the most common cause of injury-related ED discharges for adults between the ages of 20 and 44 (n=49,186).

Estimated Injury-related ED Discharges— Intent of Injury in 1999 Massachusetts Residents



(N=737,976)

Data Source: Emergency Department Injury Surveillance System, MDPH.

Note: "Other" intent (n=324) is not included.

In 1999:

- Unintentional injuries made up an estimated 94% of the total injury-related emergency department (ED) discharges in Massachusetts.
- Intentional injuries—assaults and self-inflicted—made up an estimated 4% of the total injuries treated in emergency departments.
- Assault-related injuries outnumbered self-inflicted injuries 3 to 1. This differs from deaths where suicides outnumbered homicides by more than 3 to 1.

Estimated Injury-related ED Discharges— Leading Causes by Intent in 1999

Massachusetts Residents

Unintentional		Intentional: Self-Inflicted		Intentional: Assault		Undetermined Intent	
Fall 180,829		Poisoning 5,042		Struck by/against 11,844		Poisoning 1,292	
Struck by/against 104,609		Cut/pierce 1,656		Cut/pierce 981		Cut/pierce 98	
MV Traffic-related 89,125		Suffocation 69		Firearm* 52		Fall 58	
All Other 320,640		All Other 693		All Other 8,475		All Other 295	
Total	Rate**	Total	Rate**	Total	Rate**	Total	Rate**
695,203	11,050.3	7,460	118.6	21,404	340.2	1,743	27.7

(N=737,976)

Data Source: Emergency Department Injury Surveillance System (EDISS), MDPH.

"Other" (n=324) and "Unknown" (n=11,842) intents are not included.

*Firearm injury estimates reported here are considered an underestimate. The Weapon Related Injury Surveillance System (WRISS) is an ongoing statewide data collection system that more accurately describes the intent of weapon-related injuries. In 1999, WRISS captured 86 assault-related firearm injuries treated and discharged from all emergency departments.

**Rates are per 100,000 residents.

In 1999:

- Falls were the leading cause of unintentional injuries treated in the ED. Falls were estimated to account for 25% of all injuries seen in the ED.
- Poisonings were the leading cause of self-inflicted injuries seen in the ED, accounting for an estimated 68% of all ED treated self-inflicted injuries.
- Struck by/against injuries were responsible for an estimated 15% of unintentional injuries and 55% of the assault-related injury cases treated in the ED.

Charges for Injury-related ED Discharges—Intent by Cause

Massachusetts Residents, 1999

- The emergency department charges for injury-related discharges in 1999 were estimated to have exceeded \$237 million.

Rank	Intent & Cause	Estimated Number	% of All Injuries	Rate/100,000	Mean Charge ¹
UNINTENTIONAL					
1	Fall	180,829	24.9%	2874.3	\$430
2	Struck by/ Against	104,609	14.4%	1662.8	\$311
3	Motor Vehicle Traffic	89,125	12.3%	1416.6	\$490
	<i>Occupant</i>	77,778	-	1236.3	\$477
	<i>Motorcyclist</i>	2,354	-	37.4	\$685
	<i>Pedal Cyclist</i>	1,240	-	19.7	\$583
	<i>Pedestrian</i>	3,011	-	47.9	\$744
	<i>Unspecified</i>	4,286	-	68.1	\$455
4	Cut/pierce	87,123	12.0%	1384.8	\$262
5	Overexertion	85,000	11.7%	1351.1	\$280
6	Other specified & classifiable	36,033	5.0%	572.7	\$277
	<i>Caught by/between</i>	15,778	-	250.8	\$317
	<i>Foreign Body</i>	18,743	-	297.9	\$234
	<i>Other</i>	1,512	-	24.0	\$412
7	Unspecified	34,620	4.8%	550.3	\$275
8	Natural/environmental	30,109	4.1%	478.6	\$256
	<i>Dog Bites</i>	9,975	-	158.6	\$286
	<i>Other Bites/Stings</i>	19,003	-	302.1	\$231
	<i>Other natural/environmental</i>	1,131	-	18.0	\$419
9	Fire/burn	12,340	1.7%	196.1	\$203
10	Pedal cyclist/other	11,676	1.6%	185.6	\$438
11	Poisoning	6,859	0.9%	109.0	\$478
12	Other specified, not classifiable	6,167	0.8%	98.0	\$281
13	Machinery	4,725	0.7%	75.1	\$412
14	Transport, other	4,546	0.6%	72.3	\$577
15	Suffocation	756	0.1%	12.0	\$598
16	Pedestrian, other	369	0.1%	5.9	\$464
17	Guns	196	< .1%	3.1	\$554
	<i>Firearm</i>	104	-	1.7	\$736
	<i>Non-powder gun (e.g., airgun, BB)</i>	92	-	1.5	\$359
18	Drowning/submersion	121	< .1%	1.9	\$455
ASSAULT					
1	Struck by/Against	11,844	1.6%	188.3	\$457
2	Other specified, not classifiable	4,886	0.7%	77.7	\$399
3	Other specified & classifiable	2,071	0.3%	32.9	\$430
	<i>Battering/maltreatment</i>	1,956	-	31.1	\$399
4	Unspecified	1,408	0.2%	22.4	\$551
5	Cut/pierce	981	0.1%	15.6	\$622
6	Guns	64	< .1%	1.0	\$897
	<i>Firearm</i>	52	-	0.8	\$1,016
	<i>Non-powder gun (e.g., airgun, BB)</i>	12	-	0.2	\$363
7	Fire/burn	52	< .1%	0.8	\$393
8	Suffocation	46	< .1%	0.7	\$444
9	Motor vehicle traffic	23	< .1%	0.4	\$1,114
10	Fall	17	< .1%	0.3	\$386
11	Poisoning	12	< .1%	0.2	\$420

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Charges for Injury-related ED Discharges—Intent by Cause

Massachusetts Residents, 1999

Rank	Intent & Cause	Estimated Number	% of All Injuries	Rate/100,000	Mean Charge ¹
SELF-INFLICTED					
1	Poisoning	5,042	0.7%	80.1	\$1,120
2	Cut/pierce	1,656	0.2%	26.3	\$586
3	Other specified, not classifiable	542	0.1%	8.6	\$411
4	Suffocation/Hanging	69	< .1%	1.1	\$1,186
5	Fall	46	< .1%	0.7	\$1,328
6	Unspecified	35	< .1%	0.6	\$434
7	Fire/burn	29	< .1%	0.5	\$494
8	Guns: <i>Firearms</i>	17	< .1%	0.3	\$1,263
9	Other specified & classifiable	12	< .1%	0.2	\$1,460
10	Drowning/submersion	6	< .1%	0.1	\$322
11	Natural/environmental	6	< .1%	0.1	\$391
UNDETERMINED					
1	Poisoning	1,292	0.2%	20.5	\$548
2	Unspecified	104	< .1%	1.7	\$332
3	Cut/pierce	98	< .1%	1.6	\$239
4	Fall	58	< .1%	0.9	\$355
5	Guns	52	< .1%	0.8	\$865
	<i>Firearm</i>	35	< .1%	0.6	\$1,116
	<i>Non-powder gun (e.g., airgun, BB)</i>	17	< .1%	0.3	\$237
6	Other specified, not classifiable	46	< .1%	0.7	\$474
7	Fire/burn	29	< .1%	0.5	\$272
8	Motor vehicle traffic	29	< .1%	0.5	\$1,655
9	Natural/environmental	17	< .1%	0.3	\$292
10	Suffocation	12	< .1%	0.2	\$216
11	Drowning/submersion	6	< .1%	0.1	\$324
TOTALS by Intent of Injury					
	UNINTENTIONAL	695,203	95.7%	11050.3	\$352
	ASSAULT	21,404	2.9%	340.2	\$454
	SELF-INFLICTED	7,460	1.0%	118.6	\$640
	UNDETERMINED	1,743	0.2%	27.7	\$529
	OTHER ²	324	< .1%	5.0	\$358
	<i>No E-Codes Assigned</i>	11,842	<i>n/a</i>	188.2	<i>n/a</i>
	TOTAL	737,976	100.0%	11730.2	<i>n/a</i>

(N=737,976)

Data Source: Emergency Department Injury Surveillance System, MDPH.

¹ Mean charges are based on emergency department-related charges (for fiscal year 1999) as reported by the participating hospital.

² Other intent includes legal intervention and operations of war.

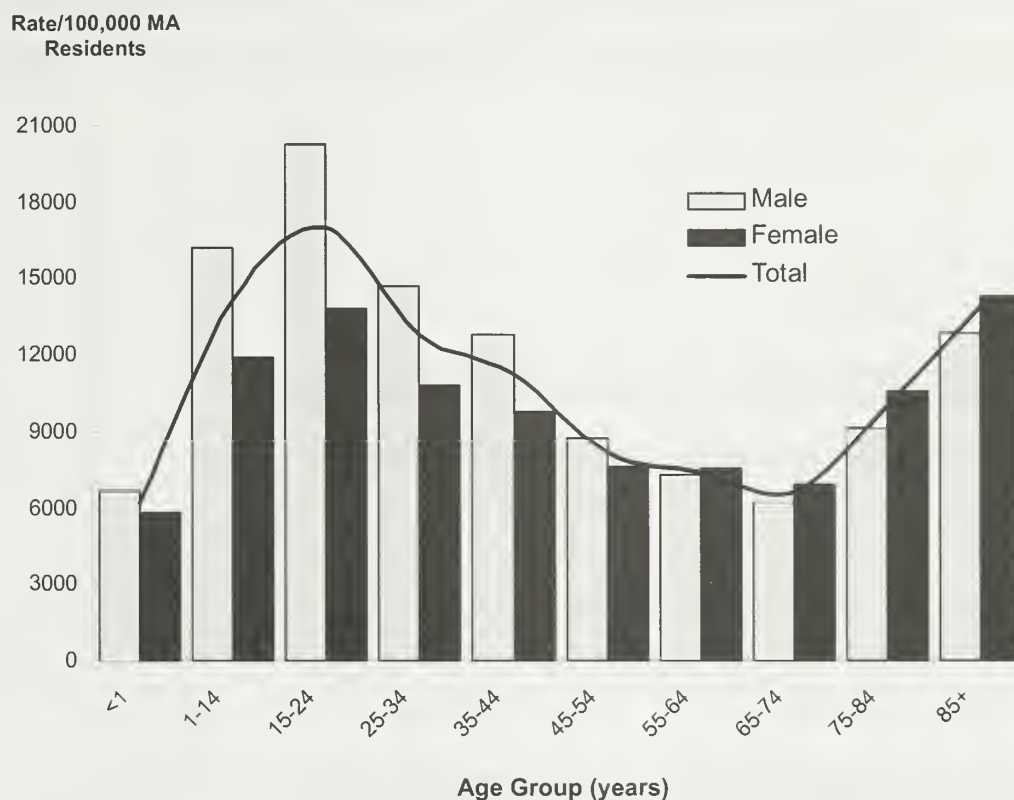
Percentage total equals more than 100% due to rounding.

In 1999:

- Among all injury intents, self-inflicted injuries had the highest mean charges.
- Self-inflicted fall, firearm and poisoning injury cases had higher emergency department-related charges compared with other self-inflicted injuries.

Estimated Injury-related ED Discharge Rates— by Sex and Age Group

Massachusetts Residents, 1999



(N=737,970)

Data Source: Emergency Department Injury Surveillance System, MDPH.

In 1999:

- An estimated 1 out of 5 males between the ages of 15-24 years was treated and discharged from an emergency department for an injury in 1999.
- Among females, those ages 85 and older had the highest estimated injury rates at 14290.7 per 100,000 followed closely by 15-24 year olds with a rate of 13824.7 per 100,000.
- Males had higher estimated rates of ED discharges for injury compared with females until the age of 54, after which females had higher rates.

Estimated Injury-related ED Discharges— Leading Causes by Age Group Massachusetts Residents, 1999

Children								
< 1 year			1-4 years			5-9 years		
Cause	est. number	percent	Cause	est. number	percent	Cause	est. number	percent
Fall	2,631	52.6	Fall	17,747	39.7	Fall	15,070	31.4
Struck by/against	696	13.9	Struck by/against	7,970	17.8	Struck by/against	10,740	22.4
Fire/burn	313	6.3	Other-classifiable	3,744	8.4	Cut/pierce	5,442	11.3
Other-classifiable	261	5.2	Cut/pierce	3,263	7.3	Nature/environment	3,118	6.5
Cut/pierce	203	4.1	Nature/environment	2,637	5.9	Other-classifiable	2,927	6.1
Other Injuries	898	18.0	Other Injuries	9,355	20.9	Other Injuries	10,688	22.3
TOTAL	5,002	100.0	TOTAL	44,716	100.0	TOTAL	47,985	100.0
Rate: 6263.4 per 100,000			Rate: 13973.8 per 100,000			Rate: 11568.0 per 100,000		

Youth					
10-14 years			15-19 years		
Cause	est. number	percent	Cause	est. number	percent
Fall	17,492	26.0	Struck by/against	15,968	19.5
Struck by/against	17,139	25.5	MV Traffic	15,452	18.9
Overexertion	6,828	10.2	Fall	11,308	13.8
Cut/pierce	5,970	8.9	Cut/pierce	9,181	11.2
Pedal cyclist	3,692	5.5	Overexertion	9,430	11.5
Other Injuries	16,072	23.9	Other Injuries	20,385	24.9
TOTAL	67,193	100.0	TOTAL	81,724	100.0
Rate: 17147.2 per 100,000			Rate: 19528.8 per 100,000		

Adult					
20-44 years			45-64 years		
Cause	est. number	percent	Cause	est. number	percent
MV Traffic	49,186	15.7	Fall	26,434	25.4
Fall	48,281	15.5	Cut/Pierce	15,046	14.5
Overexertion	47,940	15.3	Overexertion	12,749	12.3
Struck by/against	46,244	14.8	MV Traffic	12,213	11.8
Cut/Pierce	44,496	14.2	Struck by/against	10,661	10.3
Other Injuries	76,347	24.4	Other Injuries	26,762	25.8
TOTAL	312,495	100.0	TOTAL	103,865	100.0
Rate: 12493.6 per 100,000			Rate: 8167.1 per 100,000		

Older Adult					
65-74 years			75+ years		
Cause	est. number	percent	Cause	est. number	percent
Fall	12,571	42.9	Fall	29,670	63.3
Cut/Pierce	3,369	11.5	MV Traffic	2,746	5.9
MV Traffic	2,919	10.0	Unspecified	2,152	4.6
Struck by/Against	2,077	7.1	Overexertion	2,002	4.3
Overexertion	2,019	6.9	Struck by/Against	1,985	4.2
Other Injuries	6,334	21.6	Other Injuries	8,302	17.7
TOTAL	29,289	100.0	TOTAL	46,856	100.0
Rate: 6685.3 per 100,000			Rate: 11,624.2 per 100,000		

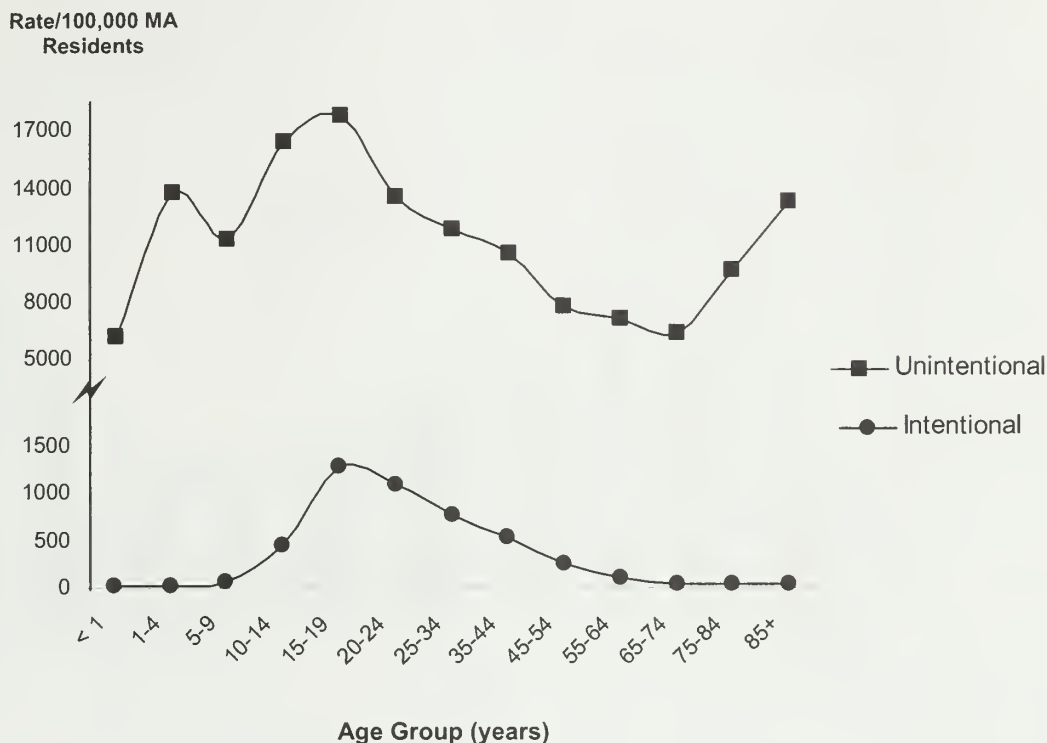
- Children ages nine years and younger had an ED injury discharge rate of 11,993.0 per 100,000.
- Youth between the ages of 10 and 19 had an ED injury discharge rate of 18,377.2 per 100,000.
- Adults 20 to 64 years of age had an ED injury discharge rate of 11,035.2 per 100,000.
- Older Adults ages 65 and over had an ED injury discharge rate of 9,051.9 per 100,000.

Selected definitions:
 "Other-classifiable" includes categories such as caught by or between objects, foreign bodies, and maltreatment.
 "Nature/environment" includes categories such as dog bites, stings, exposure to extreme cold or heat, electricity, and radiation.
 "Overexertion" includes categories such as sprains.

(N=739,125)

Data Source: Emergency Department Injury Surveillance System, MDPH.

Estimated Injury-related ED Discharge Rates— by Intent and Age Group Massachusetts Residents, 1999



(N=724,067)

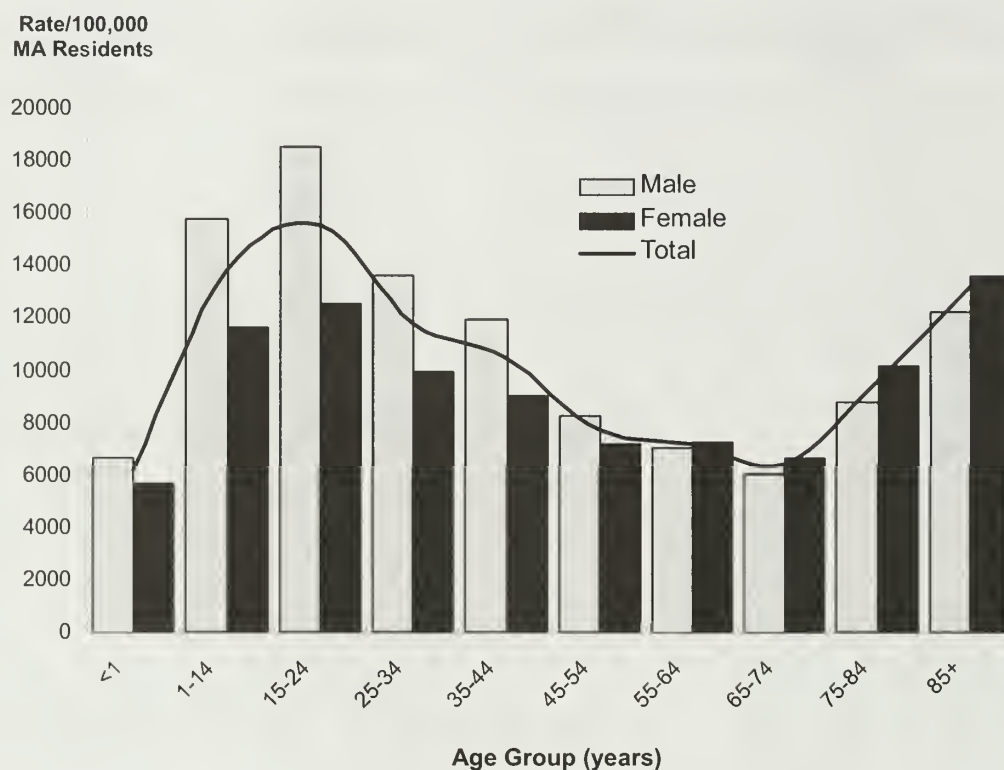
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Data Source: Emergency Department Injury Surveillance System, MDPH.

In 1999:

- Estimated emergency department visit rates for unintentional injuries ranged between 12 to 545 times higher than intentional injuries.
- Unintentional injuries surpassed intentional injuries in every age group.
- Injury-related rates for both unintentional and intentional injuries peaked between 15-19 years.

Estimated ED Discharge Rates for Unintentional Injuries— by Sex and Age Group Massachusetts Residents, 1999



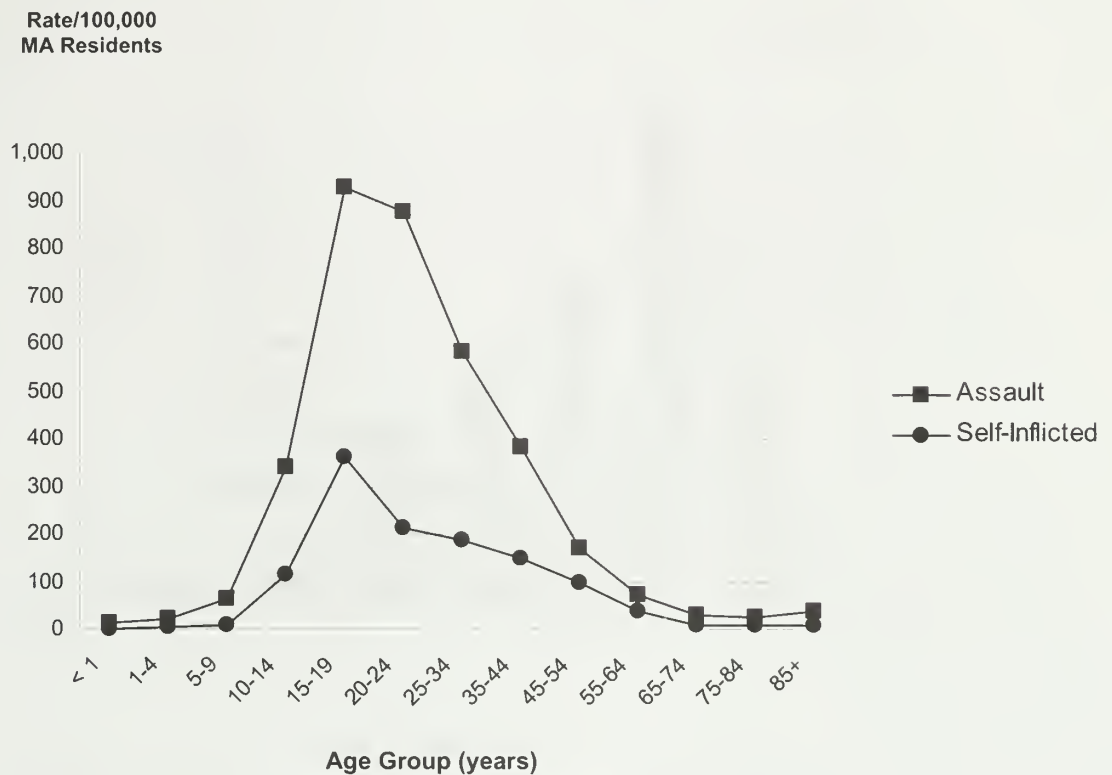
(N=695,199)

Data Source: Emergency Department Injury Surveillance System, MDPH.

In 1999:

- The highest injury-related ED discharge rate among males occurred in the 15-24 year age group (20285.6 per 100,000), followed by males ages 1-14 years.
- Among females, injury-related ED discharge rates were highest among those ages 85 and older (14290.7 per 100,000), followed by females ages 15-24 years.
- The estimated rates of unintentional injury-related ED discharges were more even across the lifespan compared with rates for injury deaths or hospital discharges. While older adults are at much higher risk for injury death and hospital discharges, younger age groups (ages 1-24 years) are at highest risk for injury-related ED discharges.

Estimated ED Discharge Rates— Self-inflicted and Assault-related Injuries by Age Group Massachusetts Residents, 1999



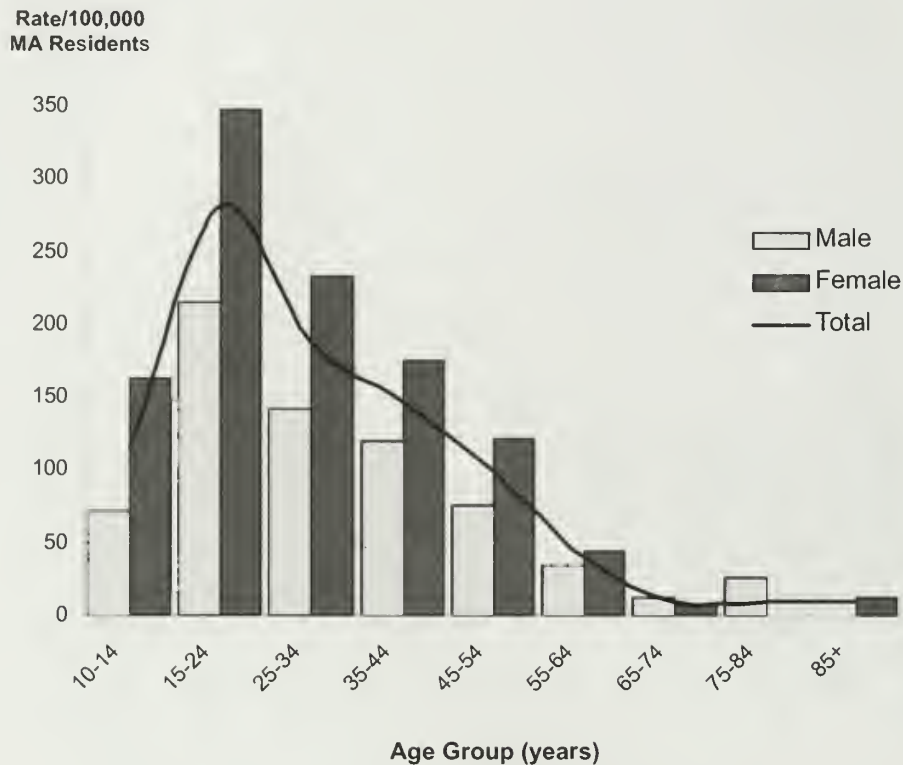
(N=28,862)

Data Source: Emergency Department Injury Surveillance System, MDPH.

In 1999:

- Estimated assault-related ED discharge rates were higher than discharge rates for self-inflicted injuries for all age groups.
- This pattern differs from injury death and hospital discharges in which suicide and self-inflicted injuries outnumber homicide and assaults for every age group over 10 years.
- Among persons ages 10-44 years, estimated ED treated assault-related injuries were between 2.6 and 4.2 times higher than ED treated self-inflicted injuries.

Estimated ED Discharge Rates for Self-Inflicted Injuries— by Sex and Age Group Massachusetts Residents, 1999



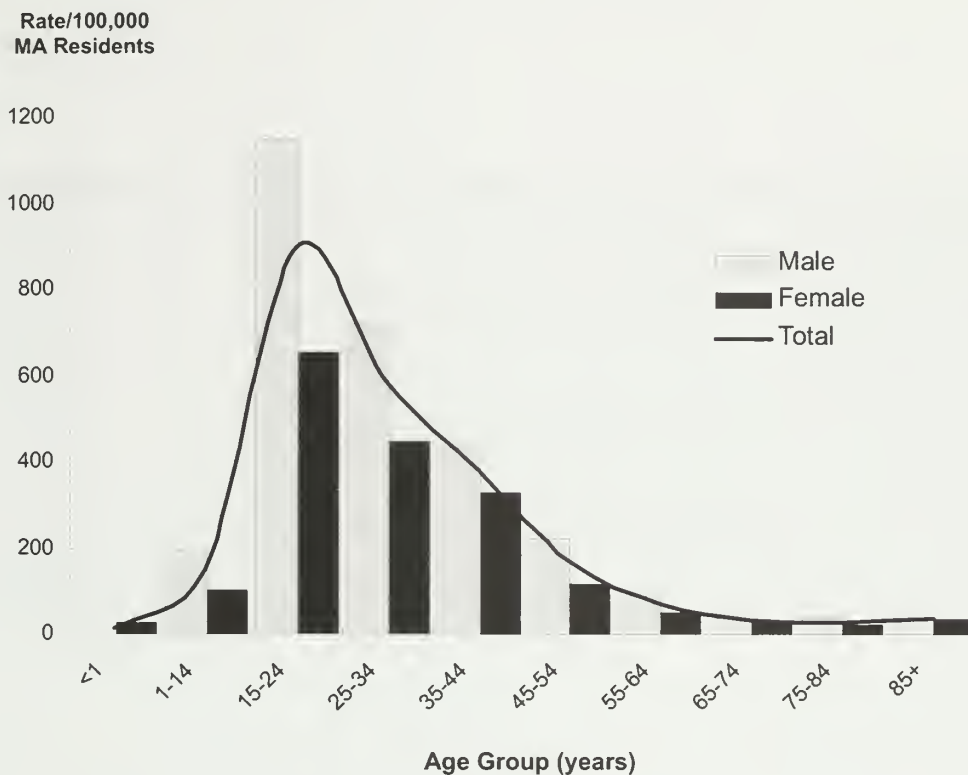
(N=7,459)

Data Source: Emergency Department Injury Surveillance System, MDPH.

In 1999:

- The overall estimated rate of ED discharges for self-inflicted injuries was 118.6 per 100,000.
- Females were estimated to have experienced greater rates of ED discharges for self-inflicted injuries compared with males for age groups 10-64 years. This female-predominance is similar to that seen for hospital discharges, but differs from suicide deaths, where males predominate.

Estimated ED Discharge Rates for Assault-Related Injuries— by Sex and Age Group Massachusetts Residents, 1999



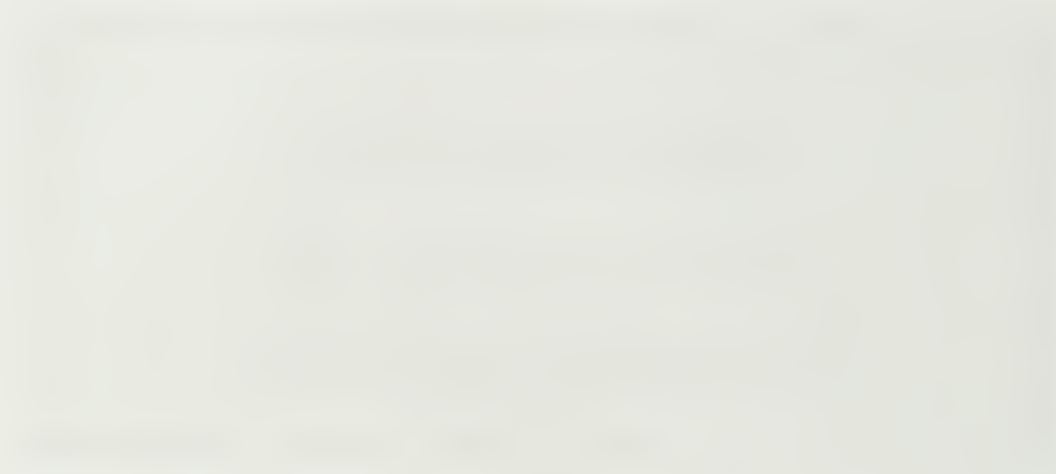
(N=21,403)

Data Source: Emergency Department Injury Surveillance System, MDPH.

In 1999:

- The overall estimated rate of ED discharges for assaults was 340.2 per 100,000 residents.
- The estimated assault-related ED visit rate for males was higher than females at all ages with the exception of those under one year where females had higher estimated rates.
- Males 15-24 had 5.3 times greater estimated rates of assault-related ED visits than females of the same age group.

Section IV:
Fact Sheets on
Selected Injuries



MOTOR VEHICLE TRAFFIC INJURIES MASSACHUSETTS 1995-1999

Injury Surveillance Program, Massachusetts Department of Public Health

Between 1995 and 1999:

- Motor vehicle traffic was the second leading cause of injury death in Massachusetts (n=2,324).
- There were an average of 465 deaths, 4,350 non-fatal hospitalizations, and an estimated 89,125 non-fatal emergency department visits due to motor vehicle traffic injuries among Massachusetts residents each year.

Figure 1.

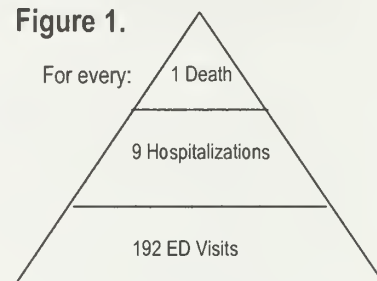
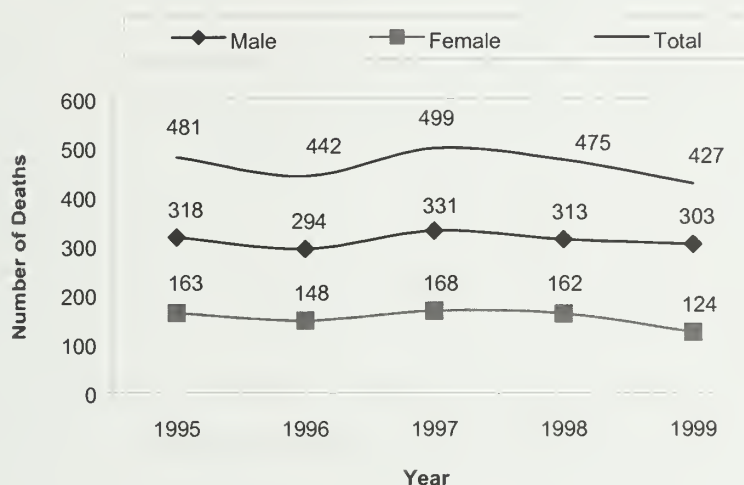


Figure 2. Trend in Motor Vehicle Traffic Deaths, Massachusetts Residents, 1995-1999



Source: Registry of Vital Records and Statistics, Massachusetts Department of Public Health

Between 1995 and 1999:

- The number of motor vehicle traffic deaths decreased 13%.
- Males were 2-3 times more likely to die due to motor vehicle traffic-related injuries compared to females.

Figure 3. Motor Vehicle Traffic-related Injury Deaths and Hospitalizations, Massachusetts Residents, 1999

MV Traffic Injury	Deaths		Hospital Discharges	
	n	%	n	%
Occupant	102	23.9	2,657	66.3
Pedal cyclist	5	1.2	124	3.1
Pedestrian	76	17.8	655	16.4
Motorcyclist	36	8.4	356	8.9
Unspecified	208	48.7	163	4.1
Other	0	0.0	49	1.2
Total	427	100.0	4,004	100.0

Source: Massachusetts Division of Health Care Finance and Policy, Massachusetts Department of Public Health
Source: Registry of Vital Records and Statistics, Massachusetts Department of Public Health

In 1999:

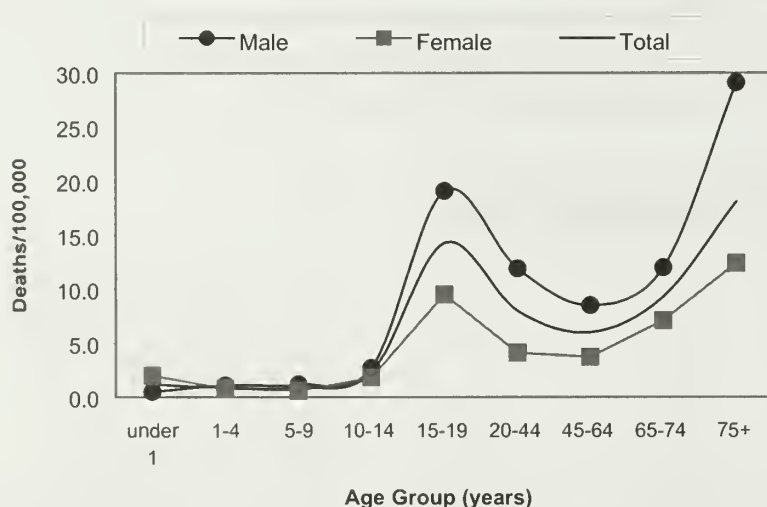
- The majority of people injured in a non-fatal MV traffic crash were passengers or drivers (66% of non-fatal hospital discharges).
- 18% of the MV traffic injury deaths and 16% of MV traffic injury hospitalizations were to pedestrians.

Figure 4. Hospitalizations for Motor Vehicle Traffic Injury by Type of Person Injured, Massachusetts Residents, 1999

MV Injury Type (Hospital Discharges)					
Occupant		n	rate/100,000	Pedestrian	
under 1 year		0	0.0	under 1 year	
1-4 years		17	-	1-4 years	
5-9 years		22	5.3	5-9 years	
10-14 years		40	10.2	10-14 years	
15-19 years		331	79.1	15-19 years	
20-44 years		1,190	47.8	20-44 years	
45-64 years		484	36.8	45-64 years	
65-74 years		217	49.1	65-74 years	
75+ years		356	84.8	75+ years	
Pedal Cyclist		n	rate/100,000	Motorcyclist	
under 1 year		0	0.0	under 1 year	
1-4 years		0	0.0	1-4 years	
5-9 years		9	-	5-9 years	
10-14 years		22	5.6	10-14 years	
15-19 years		19	-	15-19 years	
20-44 years		46	1.8	20-44 years	
45-64 years		21	1.6	45-64 years	
65-74 years		4	-	65-74 years	
75+ years		3	-	75+ years	

-- rates that are based on frequencies < 20 may be unstable and are therefore not routinely reported
Source: Massachusetts Division of Health Care Finance and Policy, Massachusetts Department of Public Health

Figure 5. Fatal Motor Vehicle Injuries by Sex and Age Group, Massachusetts Residents, 1995-1999



Source: Registry of Vital Records and Statistics, Massachusetts Department of Public Health

Between 1995 and 1999:

- The elderly (75 years and over) had the highest rates of motor vehicle traffic fatalities.
- Youth, aged 15 to 19 years, also had very high rates of motor vehicle traffic fatalities.
- Male MV traffic fatality rates begin to outnumber female rates in adolescence (15-19 years).

POISONING INJURIES

MASSACHUSETTS 1995-1999

Injury Surveillance Program, Massachusetts Department of Public Health

Between 1995 and 1999:

- Poisoning, which includes drug overdoses, was the leading cause of injury death in Massachusetts (n=2,547). 72% of these poisoning deaths were classified as of undetermined intent.
 - In 1999, narcotics and hallucinogens were associated with 70% of all poisoning deaths.
- There were an average of 509 deaths, 4,452 non-fatal hospitalizations, and an estimated 22,259 non-fatal emergency department visits due to poisoning among Massachusetts residents each year.
- 63% of non-fatal poisoning hospitalizations were self-inflicted. Tranquilizers and other psychotropic agents were associated with 44% of these cases.

Figure 1.

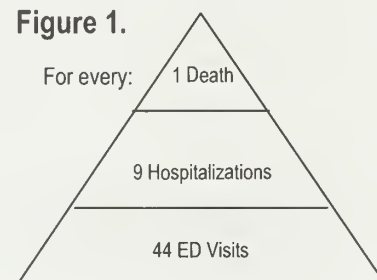
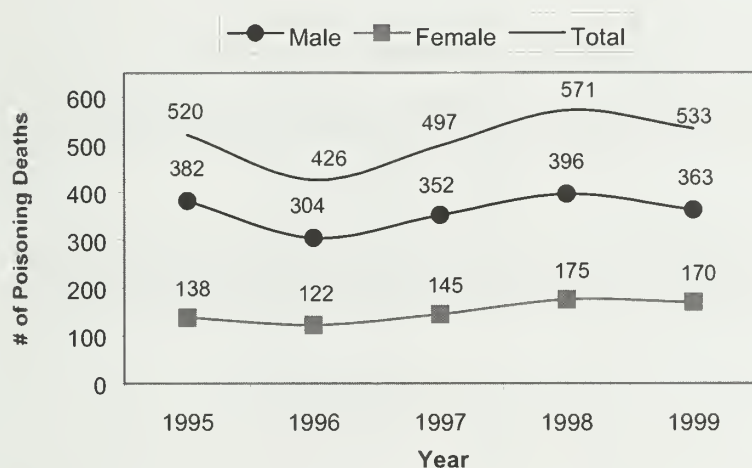


Figure 2. Trend in Poisoning Deaths, Massachusetts Residents, 1995-1999

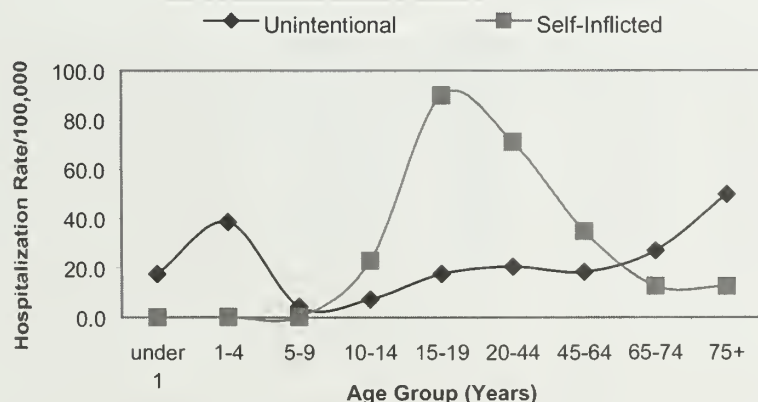


Source: Registry of Vital Records and Statistics, Massachusetts Department of Public Health

Between 1995 and 1999:

- Total poisoning deaths were relatively stable during this period although poisoning deaths among females increased 23%.
- Males were almost 2.4 times more likely to die due to poisoning compared to females.

Figure 3. Hospitalizations for Poisoning, Massachusetts Residents, 1995-1999



Source: Massachusetts Hospital Discharge Database, Massachusetts Division of Health Care Finance and Policy

Between 1995 and 1999:

- Children between the ages of 1 and 4 years and the elderly (75+ years) were at greatest risk for an unintentional poisoning. Lead paint exposure for children and ingestion of agents affecting the cardiovascular system for the elderly were the leading poisoning agents among these age groups.
- The leading agent of self-inflicted poisoning for youths between the ages of 10 and 19 years was analgesics; tranquilizers predominated for those between the ages of 20 and 64 years.

Figure 4. Poisoning Deaths and Hospitalizations by Intent: Leading Agents¹, Massachusetts Residents, 1999

Hospital Discharges			Deaths		
Unintentional	n	%	Unintentional	n	%
Benzodiazepine-based Tranquilizers	201	14.6%	Other and unspecified narcotics	23	31.9%
Heroin	118	8.6%	Toxic effects of Carbon Monoxide	11	15.3%
Antidepressants	106	7.7%	Other & Unspec. Drugs, Medic, Biol. Sub.	10	13.9%
Surface and infiltration anesthetics	78	5.7%	Cocaine	9	12.5%
All Other	871	63.4%	Heroin	3	4.2%
---	---	---	Other opioids	3	4.2%
---	---	---	All Other	13	18.1%
TOTAL	1,374	100.0%	TOTAL	72	100.0%
Self-Inflicted			Suicide		
Benzodiazepine-based Tranquilizers	641	19.3%	Toxic effects of Carbon Monoxide	41	24.4%
Antidepressants	583	17.6%	Other & Unspec. Drugs, Medic, Biol. Sub.	26	15.5%
Aromatic Analgesics NEC	409	12.3%	Tricyclic and Tetracyclic antidepressants	20	11.9%
Antiallergic and antiemetic drugs	153	4.6%	Other and unspecified antidepressants	14	8.3%
Salicylates (i.e. aspirin)	117	3.5%	Other opioids	9	5.4%
Other and unspec anticonvulsants	113	3.4%	All other	58	34.5%
All Other	1,302	39.2%	---	---	---
TOTAL	3,318	100.0%	TOTAL	168	100.0%
Assault			Homicide		
Unspecified Sedative or Hypnotic	1	100.0%	Antiallergic and antiemetic drugs	1	50.0%
---	---	---	Other & Unspec. Drugs, Medic, Biol. Sub.	1	50.0%
TOTAL	1	9.1%	TOTAL	2	100.0%
Undetermined			Undetermined		
Benzodiazepine-based Tranquilizers	65	19.8%	Other unspecified narcotics	259	49.3%
Antidepressants	36	11.0%	Cocaine	136	25.9%
Heroin	27	8.2%	Other & Unspec. Drugs, Medic, Biol. Sub.	35	6.7%
Surface and infiltration anesthetics	25	7.6%	Tricyclic and Tetracyclic antidepressants	18	3.4%
Opium, unspecified	14	4.3%	Other opioids	18	3.4%
Aromatic Analgesics NEC	13	4.0%	All Other	59	11.2%
All Other	148	45.1%	---	---	---
TOTAL	328	22.1%	TOTAL	525	100.0%

Source: Massachusetts Hospital Discharge Database, MA Division of Health Care Finance and Policy; Registry of Vital Records and Statistics, Massachusetts Department of Public Health.

Note: More than one poisoning may be listed per case.

In 1999:

- Benzodiazepine-based tranquilizers were the leading agents used in poisoning-related hospitalizations for unintentional and self-inflicted injuries, and injuries of undetermined intent.
- Other and unspecified narcotics were the leading cause of unintentional and undetermined intent poisoning *deaths*. Toxic effects of carbon monoxide were the leading causes of *fatal* suicides due to poisoning.

Poisoning Agent Category	Examples Given
Benzodiazepine-based Tranquilizers	<i>includes:</i> Diazepam, Lorazepam, Nitrazepam
Antidepressants	<i>includes:</i> MAO inhibitors, Amitriptyline
Surface & infiltration anesthetics	<i>includes:</i> Cocaine, Lidocaine, Procaine
Aromatic analgesics, NEC	<i>includes:</i> Acetaminophen
Antiallergic and antiemetic drugs	<i>includes:</i> Antihistamines, Chlorpheniramine
Salicylates	<i>includes:</i> Aspirin
Other & unspecified anti-convulsants	<i>includes:</i> Primidone

Based on ICD-9-CM poisoning diagnosis classification codes.

SUFFOCATION INJURIES

MASSACHUSETTS 1995-1999

Injury Surveillance Program, Massachusetts Department of Public Health

Between 1995 and 1999:

- Suffocation was the third leading cause of death in Massachusetts. 61% of these suffocation deaths were suicides. 29% were due to unintentional choking.
- There were an average of 280 deaths, 264 non-fatal hospitalizations, and an estimated 883 non-fatal Emergency Department visits due to suffocation among Massachusetts residents each year.
- 93% of non-fatal suffocation hospitalizations were unintentional. Inhalation or ingestion of food or objects comprised 99% of these accidental suffocations.

Figure 1.

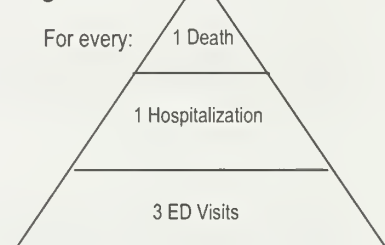
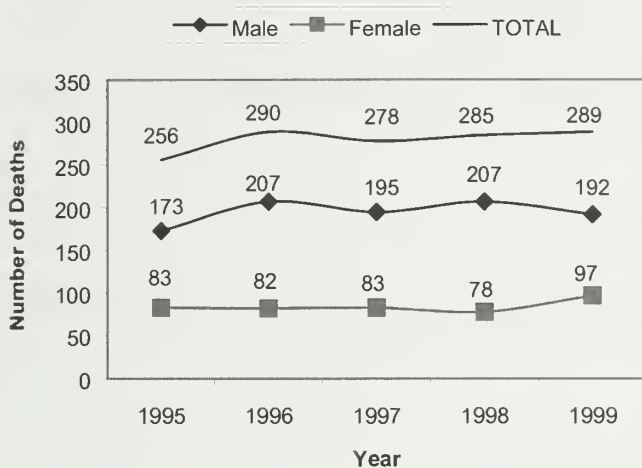


Figure 2. Trend in Suffocation Deaths, Massachusetts Residents, 1995-1999

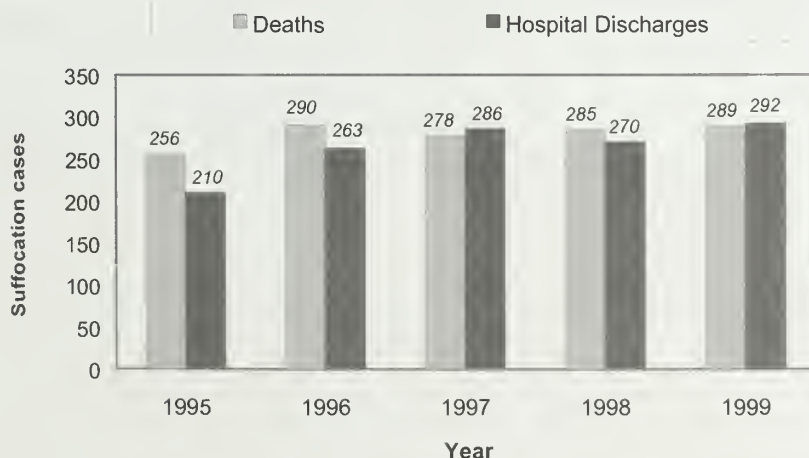


Source: Registry of Vital Records and Statistics, Massachusetts Department of Public Health
Please note that cases for which sex was missing are not included (n=1).

Between 1995 and 1999:

- 1,398 people died due to suffocation in Massachusetts.
- Males were almost 2 times more likely to die due to suffocation compared to females.
- The number of suffocation deaths increased 11% from 1995 to 1999.
- 7% of homicides in children less than one year of age were due to suffocation.

Figure 3. Suffocation-related Injury Deaths and Hospitalizations, Massachusetts Residents, 1995-1999



Source: Registry of Vital Records and Statistics, Massachusetts Department of Public Health
Massachusetts Hospital Discharge Database, Massachusetts Division of Health Care Finance and Policy

Between 1995 and 1999:

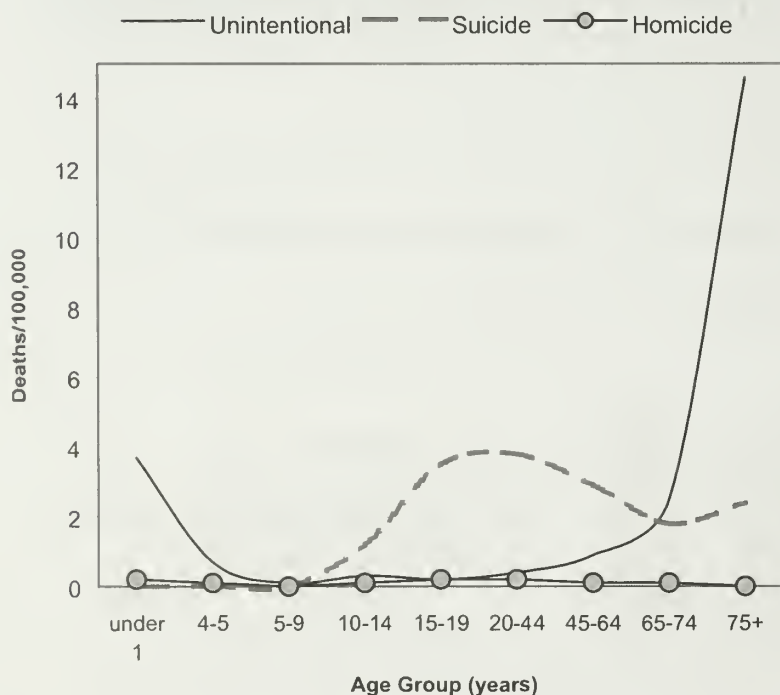
- Non-fatal suffocation-related hospital discharges increased 39%.
- The frequency of fatal suffocations remained relatively stable.

Figure 4. Suffocation-related Injury Deaths and Hospitalizations by Intent, Massachusetts Residents, 1999

Hospitalizations			Deaths		
Unintentional	n	%	Unintentional	n	%
Inhalation/Ingestion of Food	113	41.5	Inhalation/Ingestion of Food	15	12.3
Inhalation/Ingestion of Object	155	57.0	Inhalation/Ingestion of Object	72	59.0
Suffocation in Bed/Cradle	1	0.4	Suffocation in Bed/Cradle	1	0.8
Falling Earth	1	0.4	Other Accidental Hanging/Strangulation	5	4.1
Other Specified Means	2	0.7	Falling Earth	1	0.8
Total	272	100.0	Inhalation of Gastric Contents	8	6.6
Self-Inflicted	n	%	Other Specified Means (e.g. plastic bag)	4	3.3
Hanging	16	84.2	Unspecified Means	16	13.1
Suffocation by Plastic Bag	1	5.3	Total	122	100.0
Other Specified Means	2	10.5	Suicide	n	%
Total	19	100.0	Hanging/Strangulation/Suffocation	156	100.0
Assault-Related	n	%	Total	156	100.0
Hanging/Strangulation	1	100.0	Homicide	n	%
Total	1	100.0	Hanging/Strangulation/Suffocation	9	100.0
TOTAL	292	100.0	Total	9	100.0
			Undetermined Intent	n	%
			Hanging/Strangulation/Suffocation	2	100.0
			Total	2	100.0
			TOTAL	289	100.0

Sources: Registry of Vital Records and Statistics, Massachusetts Department of Public Health and Massachusetts Hospital Discharge Database, Massachusetts Division of Health Care Finance and Policy

Figure 5. Suffocation-related Injury Death Rates by Age Group and Intent, Massachusetts Residents, 1995-1999



Source: Registry of Vital Records and Statistics, Massachusetts Department of Public Health

From 1995 to 1999:

- Infants and the elderly, 75 years and older, were at highest risk for death due to unintentional suffocation.
- Suicide suffocation fatality rates were highest among age groups 15-19 and 20-44.

FALL INJURIES

MASSACHUSETTS 1995-1999

Injury Surveillance Program, Massachusetts Department of Public Health

Between 1995 and 1999:

- Falls were the leading cause of injury-related Hospital and ED discharges.
- Falls were the fourth leading cause of injury death.
- There were an average of 206 deaths, 21,979 non-fatal hospitalizations, and an estimated 180,950 non-fatal Emergency Department visits due to fall injuries among Massachusetts residents each year.

Figure 1.

For every:

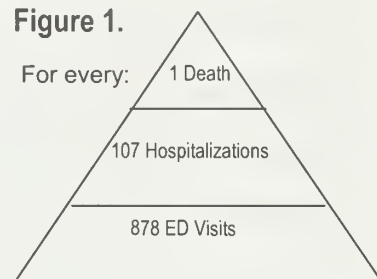
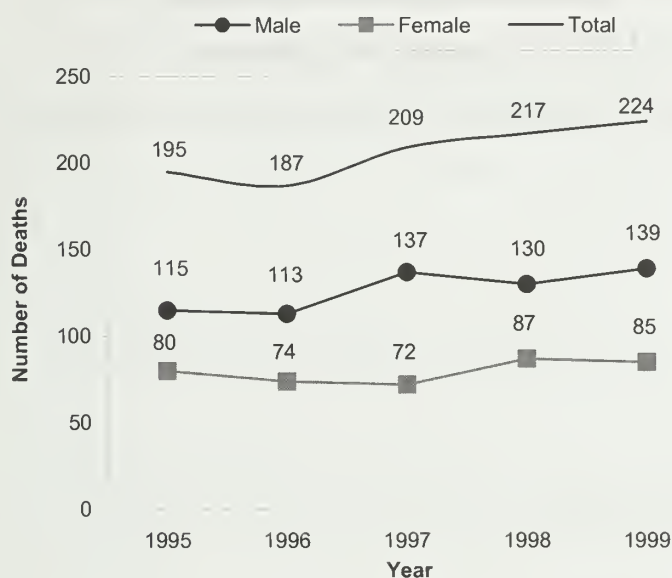


Figure 2. Trend in Fall Injury Deaths, Massachusetts Residents, 1995-1999

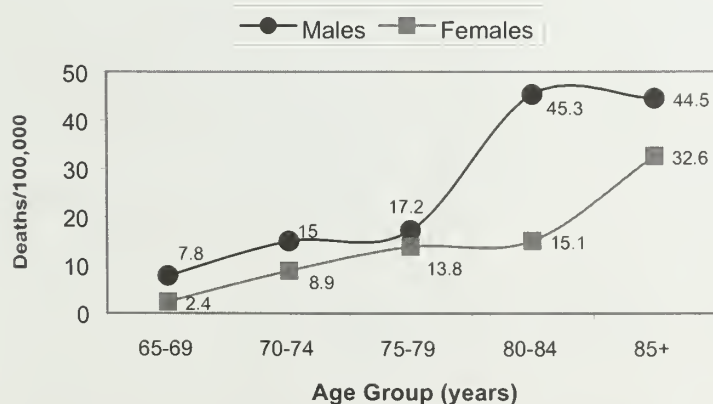


Source: Registry of Vital Records and Statistics, Massachusetts Department of Public Health

Between 1995 and 1999:

- 1,032 people died due to a fall in Massachusetts.
- Males were 1.6 times more likely to die due to fall-related injuries compared to females.
- The number of fall deaths increased 15%.

Figure 3. Fall Injury Deaths to the Elderly, Massachusetts Residents, 1999



Source: Registry of Vital Records and Statistics, Massachusetts Department of Public Health

In 1999:

- 137 people ages 65 years and over died due to a fall in Massachusetts.
- Between the ages of 75-79 and 80-84 years, there was a 2.6 fold surge in fall death rates to men. Fall death rates to women remained relatively stable between these age groups.
- 59% of fall deaths to the elderly (65 years and over) occurred at home and 18% occurred at a residential institution (e.g. nursing home).

Figure 4. Hospitalizations for Unintentional Fall Injuries: Leading Diagnosis and External Cause, By Age Group, Massachusetts Residents, 1999

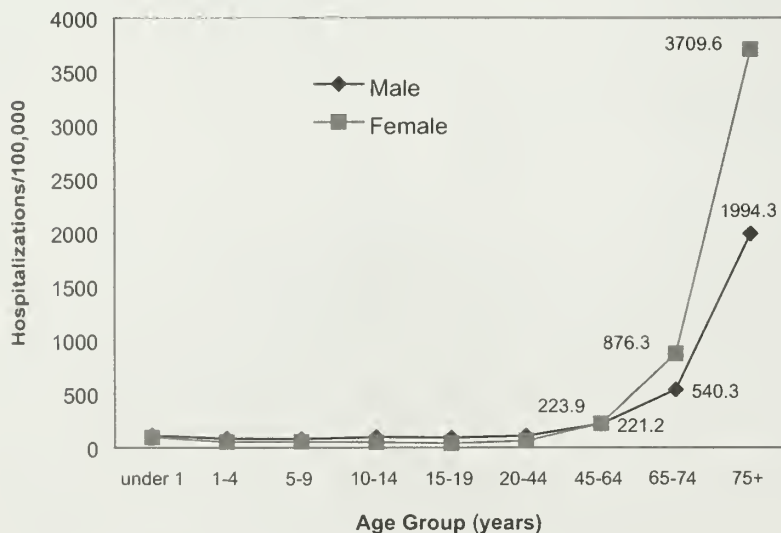
Age Group	Leading Body Region Injured with Most Common <i>Subsite</i> *		Leading Cause	
under 1 year	Skull Fracture	41%	Other Fall from one level to another	32%
1-4 years	Lower Extremity Fracture (upper leg and thigh)	38%	Other Fall from one level to another	16%
5-9 years	Upper Extremity Fracture (shoulder and upper arm)	53%	Fall from playground equipment	26%
10-14 years	Upper Extremity Fracture (forearm and elbow)	39%	Fall on same level from slipping, tripping, or stumbling	27%
15-19 years	Lower Extremity Fracture (lower leg and ankle)	40%	Fall on same level from slipping, tripping, or stumbling	25%
20-44 years	Lower Extremity Fracture (lower leg and ankle)	51%	Fall on same level from slipping, tripping, or stumbling	28%
45-64 years	Lower Extremity Fracture (lower leg and ankle)	55%	Fall on same level from slipping, tripping, or stumbling	36%
65-74 years	Lower Extremity Fracture (hip)	56%	Fall on same level from slipping, tripping, or stumbling	38%
75+ years	Lower Extremity Fracture (hip)	61%	Fall on same level from slipping, tripping, or stumbling	35%

*Based upon Barell Index Classification

Source: Massachusetts Division of Health Care Finance and Policy, Massachusetts Department of Public Health

- The most common fall-related injury hospitalizations were fractures. The anatomic site of these fractures varied by age group.

Figure 5. Fall-related Injury Hospitalizations by Age Group and Sex, Massachusetts Residents, 1995-1999



Between 1995 and 1999:

- There were 109,883 fall-related hospitalizations. Injury rates surge for both males and females at age 65 and over. Female rates outnumber male rates at this stage in life.
- In 1999, total charges for fall-related injury hospitalizations was \$203,129,475.

Source: Massachusetts Division of Health Care Finance and Policy, Massachusetts Department of Public Health

GUNSHOT INJURIES

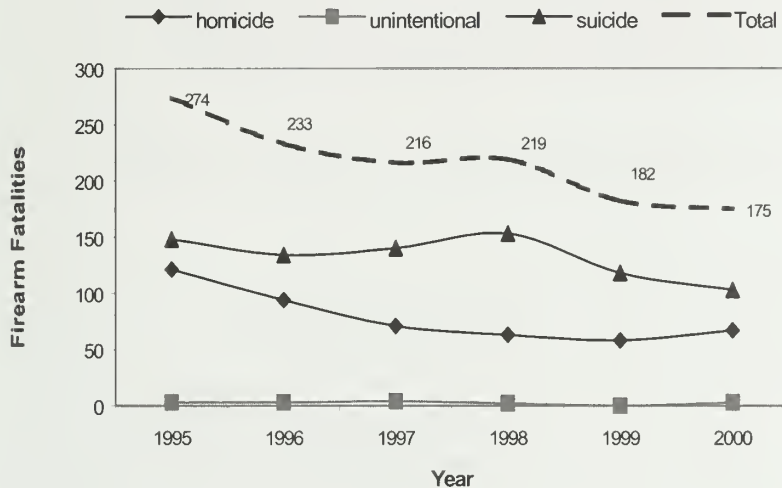
MASSACHUSETTS 1995-2000

Injury Surveillance Program, Massachusetts Department of Public Health

Between 1995 and 2000:

- Firearms took the lives of 1,299 Massachusetts residents. The majority of these firearm deaths were suicides (61%). 36% of firearm deaths were homicides.
- Firearms caused an average of 217 deaths, 260 hospitalizations and 175 nonfatal emergency department (ED) visits among Massachusetts residents each year.

Figure 2. Trend in Firearm Deaths by Intent, Massachusetts Residents, 1995-2000

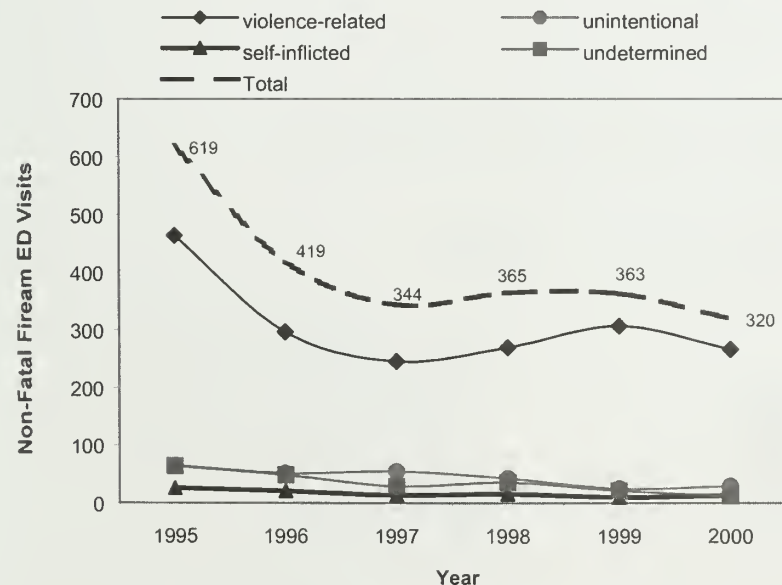


Source: Registry of Vital Records and Statistics, Massachusetts Department of Public Health
Total includes undetermined and other firearm injuries not shown.

Between 1995 and 2000:

- 1,299 people died due to firearms in Massachusetts.
- Firearm homicides decreased 45% from 121 cases in 1995 to 67 in 2000.
- After a period of relatively little change, firearm suicides decreased 33%, from 153 cases in 1998 to 103 in 2000.

Figure 1. Trend in ED Visits for Firearm Injuries by Intent, Massachusetts Residents, 1995-2000



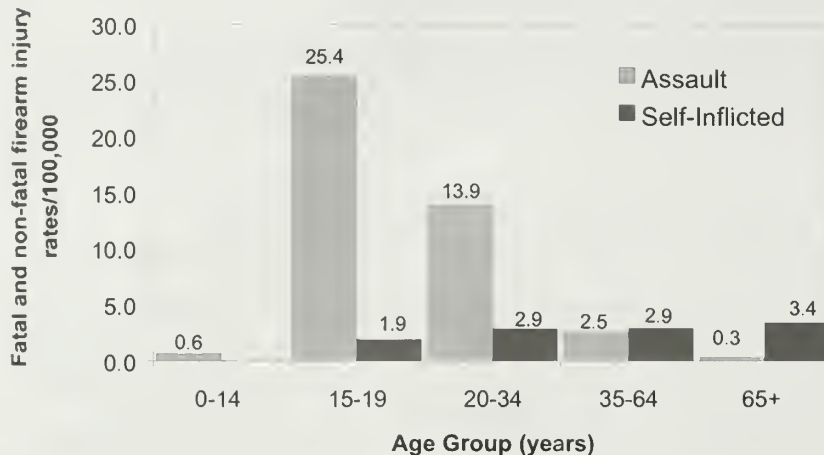
Source: Weapon-Related Injury Surveillance System, Massachusetts Department of Public Health

Massachusetts Department of Public Health's Weapon-Related Injury Surveillance System collects data on all gunshot injuries and assault-related stabbings treated at emergency departments (EDs) throughout the state.

Between 1995 and 2000:

- 2,430 non-fatal firearm cases were treated in Massachusetts EDs.
- Non-fatal firearm injuries due to assault decreased 43% from 464 cases in 1995 to 266 in 2000.
- Unintentional non-fatal firearm injuries decreased 55% from 1995 to 2000 from 65 to 29 cases.

Figure 3. Firearm Death and Injury Rates, By Intent and Age Group, Massachusetts Residents, 1995-2000

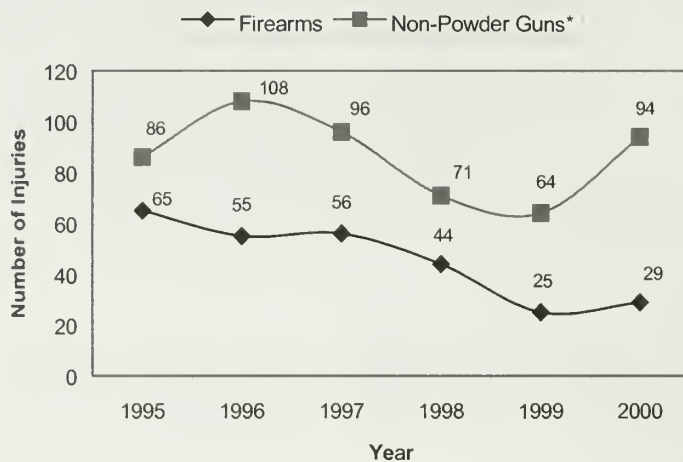


Source: Registry of Vital Records and Statistics, Massachusetts Department of Public Health; Weapon-Related Injury Surveillance System, Massachusetts Department of Public Health

Between 1995 and 2000:

- 15-19 year had the highest rates of firearm-related homicide and assault.
- Those 65 years and had the highest rates for suicide and self-inflicted injury by firearm.

Figure 4. Unintentional Gunshot Injuries Treated at Massachusetts Emergency Departments, 1995-2000

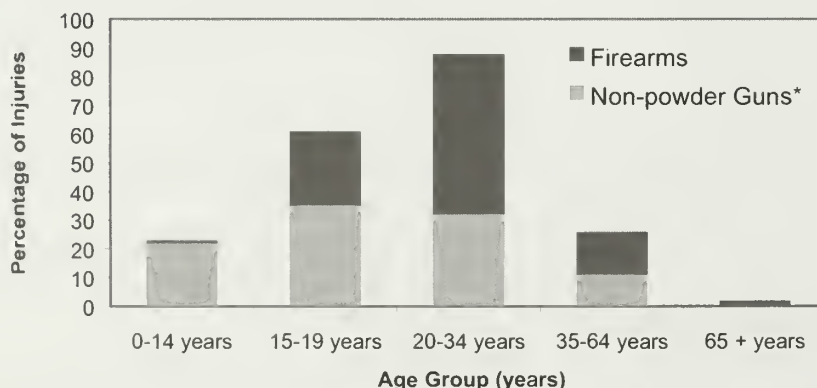


Source: Weapon-Related Injury Surveillance System, Massachusetts Department of Public Health
* Non-powder guns primarily consist of BB and pellet guns.

Between 1995 and 2000:

- Unintentional non-powder gun injuries treated in emergency departments increased 9%.
- Unintentional firearm injuries treated in emergency departments decreased 55%.

Figure 5. ED-Treated Gunshot Injuries by Age Group and Gun Type, Massachusetts 2000



Source: Weapon-Related Injury Surveillance System, Massachusetts Department of Public Health
* Non-powder guns primarily consist of BB and pellet guns.

In 2000:

- Victims of non-powder gun injuries were younger than firearm injury victims. 21% of non-powder gun victims were under 15 years of age, compared to only 1% of firearm victims.

Appendix

Methods and Technical Notes

DATA SOURCES:

Primary sources:

Mortality (Death) Data: 1995-1999

Registry of Vital Records and Statistics, Massachusetts Department of Public Health. All injury death analyses are based on a calendar year (January 1 – December 31).

Hospital Discharge Data: 1995-1999

Massachusetts Hospital Discharge Database (MHDDS), Massachusetts Division of Health Care Finance and Policy. All injury-related hospital discharge analyses are based on a fiscal year (October 1 – September 30).

Emergency Department Discharge Data: 1999

Emergency Department Injury Surveillance System (EDISS), Massachusetts Department of Public Health. All injury-related emergency department discharge analyses are based on a fiscal year (October 1 – September 30).

Other sources:

Weapon-Related Emergency Department Data: 1995-2000

Weapon Related Injury Surveillance System (WRISS), Massachusetts Department of Public Health. WRISS is a statewide emergency department-based system collecting data on weapon-related injuries. WRISS was used in the summary fact sheet on gunshot-related injuries (pgs. 59-60) rather than relying on emergency department estimates from EDISS. All WRISS analyses are based on a calendar year (January 1 – December 31).

Population:

Population estimates generated by the Massachusetts Institute for Social and Economic Research (MISER) were used to calculate rates for this report; 1995 through 1998 population estimates were averaged to calculate rates for multiple years (1995-1999); 1998 population estimates were used to calculate 1999 single-year rates.

INJURY CASE DEFINITIONS:

Death Data:

- For 1995-1998, an injury death was defined as any death with an ICD-9 external cause code ranging from 800-999 in the underlying cause of death field. Deaths due to surgical and medical complications (870-879), adverse effects of therapeutic drugs (930.0-949.9), and late effects of injuries (929, 959, 969, 989, 999) were excluded from these analyses.
- For 1999, an injury death was defined as any death with an ICD-10 external cause code ranging from V01-Y89 in the underlying cause of death field. Deaths due to surgical and medical complications (Y60-Y84, Y88.1-.3), adverse effects of therapeutic drugs (Y40-Y59, Y88.0), and the late effects of injuries (Y85-Y87, Y89) were excluded from these analyses.

Hospital Discharge Data:

An injury-related hospital discharge was defined as any case which was assigned an ICD-9-CM Nature of Injury Code ranging from 800-999 to any of the diagnosis fields. Injury-related cases due to certain adverse effects including complications of medical or surgical care (995.0-995.4, 995.6, 995.7, 995.86, 995.89, and 996-999), and the late effects of injuries (905-909) were excluded if no other valid ICD-9-CM code was present.

Persons who died during admission or transferred to another acute care facility were excluded from hospital discharge analyses in order to avoid duplication.

Emergency Department Data—Discharge Estimates:

An injury-related ED discharge was defined as any case which was assigned an ICD-9-CM Nature of Injury Code ranging from 800-999 to any of the diagnosis fields. Injury-related cases due to certain adverse effects including complications of medical or surgical care (995.0-995.4, 995.6, 995.7, 995.86, 995.89, and 996-999), and the late effects of injuries (905-909) were excluded if no other valid ICD-9-CM code was present.

Persons who died during treatment, or were subsequently admitted to the hospital, were excluded from emergency department analyses in order to avoid duplication.

Statewide estimates are based on a sample of 12 hospital emergency departments that participate in EDISS. Statewide injury estimates are generated by multiplying the number of injuries in the sampled population by a factor that is based upon the ratio of ED visits in all MA hospitals in 1999 to the number of ED visits in the sampled hospitals. Total emergency department visit data was obtained from the MA Division of Health Care Finance and Policy.

GENERAL NOTES:

Injuries are classified using multiple parameters. For example, an injury may be classified by a diagnosis (e.g., a fracture), or by the mechanism or external cause of the injury (e.g., a fall). Injuries are also classified by intent: unintentional ("accidents") or intentional (assaults/homicides or self-inflicted/suicides).

In this report injuries are classified by their external cause and intent according to the International Classification of Diseases (ICD) system. In 1999 this revised version, ICD-10, was implemented for classifying deaths. Certain injury categories may not be comparable between ICD-9 (the previous version) and ICD-10.

A modified version of the *Matrix of E-code Groupings for Presenting Injury Mortality and Morbidity Data*, developed by the Centers for Disease Control and Prevention, was used to group injury categories. This grouping of ICD-9 and ICD-10 external causes of injury codes can be found on pages 65 and 66.

Analyses for injury *deaths* include Massachusetts residents who died in or out-of-state. All other analyses include Massachusetts residents admitted and released from a Massachusetts acute care hospital or treated and discharged from an emergency department. Massachusetts residents treated at hospitals out of state are not included. Non-Massachusetts residents were excluded from *all* analyses presented in this report.

DATA LIMITATIONS:

Massachusetts Outpatient Observation Bed Database:

The Massachusetts Division of Health Care, Finance and Policy maintains a database of cases treated in the hospital but classified as an "observation stay." These cases are not included in this report.

Emergency Department Injury Surveillance System (EDISS):

The methodology used to generate statewide injury estimates assumes, 1) that the ratio of injury cases to non-injury cases is constant across all EDs, and 2) that the distribution of injuries in the sampled EDs is similar to the distribution of injuries in the non-sampled EDs.

Weapon-Related Injury Surveillance System (WRISS):

Hospital reviews indicate that WRISS captures approximately 80-85% of all gunshot wounds treated at the emergency department level. ED treated gunshot injury counts reported in the fact sheet (pgs. 59-60) are therefore underestimated by approximately 15-20%.

Limitations of Small Numbers:

The cells in some tables contain small numbers. Rates based on fewer than five observations are suppressed. Rates based on numbers less than 20 may be unstable; trends based upon these values should be interpreted cautiously.

RATES:

Death rates for Hispanic, American Indian, and Asian and other Pacific Islander persons should be interpreted with caution because of inconsistencies in reporting Hispanic origin or race on the death certificate as compared with race on censuses. Levels of mortality are biased from mis-reporting in the numerator and under coverage in the denominator of the death rates for Hispanics, American Indians and Asians.

All rates reported are per 100,000 individuals.

Age-Specific Rate:

A rate for a specified age group is calculated by dividing the actual number of cases in a given year for a specific age group by the population in that age group for that year. The numerator and the denominator refer to the same age group.

Formula:

$$\begin{array}{lcl} \text{Age-specific Rate} & \frac{\text{\# of cases among residents}}{\text{(ages 25-34) in a given year}} & \\ \text{(for ages 25-34) =} & \frac{\text{population of residents (ages 25-34) in}}{\text{that year}} & \times 100,000 \end{array}$$

Average Annual Rate:

An average annual rate is used when combining multiple years of data. To calculate the average annual rate of injuries among Massachusetts residents, the total number of injuries for the specified time period are averaged, divided by the averaged total population for the specified time period. The numerator and the denominator refer to the same time period studied.

Formula:

$$\text{Average Annual Rate} = \frac{\begin{array}{c} \text{\# of cases among residents during time} \\ \text{period studied} \\ \text{divided by \# of years studied} \end{array}}{\begin{array}{c} \text{sum of resident population during time} \\ \text{period studied divided by \# of years} \\ \text{studied} \end{array}} \times 100,000$$

Crude Death Rate:

The crude death rate represents the number of occurrences of a health event in a specified time and population per unit time. It is calculated as follows.

Formula:

$$\text{Crude Rate} = \frac{\begin{array}{c} \text{\# of resident injury deaths (or injuries)} \\ \text{in a year} \end{array}}{\text{resident population for that year}} \times 100,000$$

ICD-9 External Cause of Injury Codes for Mortality and Morbidity Data

Mechanism/Cause	Manner/Intent				
	Unintentional	Suicide/Self-inflicted	Homicide/Assault	Undetermined	Legal/Other ²
Cut/pierce	E920.0-.9	E956	E966	E986	E974
Drowning/submersion	E830.0-.9, E832.0-.9, E910.0-.9	E954	E964	E984	
Fall	E880.0-E886.9, E888	E957.0-.9	E968.1	E987.0-.9	
Fire/burn	E890.0-E899, E924.0-.9	E958.1,.2,.7	E961, E968.0,.3	E988.1,.2,.7	
Fire/flame	E890.0-E899	E958.1	E968.0	E988.1	
Hot object/substance	E924.0-.9	E958.2,.7	E961, E968.3	E988.2,.7	
Firearm	E922.0-.3,.8,.9	E955.0-.4	E965.0-.4	E985.0-.4	E970
Machinery	E919 (.0-.9)				
Motor vehicle traffic	E810-E819 (.0-.9)	E958.5	E968.5	E988.5	
Occupant	E810-E819 (.0,.1)				
Motorcyclist	E810-E819 (.2,.3)				
Pedal cyclist	E810-E819 (.6)				
Pedestrian	E810-E819 (.7)				
Unspecified	E810-E819 (.9)				
Pedal cyclist, other	E800-E807 (.3), E820-E825 (.6), E826.1,.9, E827-E829 (.1)				
Pedestrian, other	E800-807 (.2), E820-E825 (.7), E826-E829 (.0)				
Transport, other	E800-E807 (.0,.1,.8,.9) E820-E825 (.0-.5,.8,.9) E826.2-.8 E827-E829 (.2-.9), E831.0-.9, E833.0-E845.9	E958.6		E988.6	
Natural/environmental*	E900.0-E909, E928.0-.2	E958.3		E988.3	
Bites and stings	E905.0-.6,.9, E906.0-.4,.5,.9				
Overexertion	E927				
Poisoning**	E850.0-E869.9	E950.0-E952.9	E962.0-.9	E980.0-E982.9	E972
Struck by, against	E916-E917.9		E960.0; E968.2		E973, E975
Suffocation***	E911-E913.9	E953.0-.9	E963	E983.0-.9	
Other specified and classifiable	E846-E848, E914-E915 E918, E921.0-.9, E922.4 E923.0-.9, E925.0-E926.9 E928.3, E929.0-.5	E955.5,.6,.9 E958.0,.4	E960.1, E965.5-.9 E967.0-.9, E968.4,.6,.7	E985.5,.6 E988.0,.4	E971, E978 E990-E994, E996, E997.0-.2
Other specified, not elsewhere classifiable	E928.8, E929.8	E958.8, E959	E968.8, E969	E988.8, E989	E977, E995, E997.8, E998, E999
Unspecified	E887, E928.9, E929.9	E958.9	E968.9	E988.9	E976, E997.9
ALL INJURY	E800-E869, E880-E929	E950-E959	E960-E969	E980-E989	E970-E978, E990-E999
Adverse effects					E870-E879 E930.0-E949.9

¹Proposed Matrix of E-code Groupings for Presenting Injury Mortality and Morbidity, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. June 15, 2001

²Includes legal intervention and operations of war.

*Natural/environmental includes but is not limited to: animal bites and injuries, insect bites/stings, exposure to extreme cold, heat, weather or altitude, earthquakes, electricity, and radiation.

**Poisoning includes but is not limited to: overdose by drugs (legal and illegal), medicinal substances and biological agents, and inhalation of gases and vapors.

***Suffocation includes but is not limited to: choking, strangled, hanging, and suffocation by plastic.

ICD-10 External Cause of Injury Codes for Mortality Data¹

Mechanism/Cause	Manner/Intent				
	Unintentional	Suicide	Homicide	Undetermined	Legal/Other ²
Cut/pierce	W25-W29, W45	X78	X99	Y28	Y35.4
Drowning/submersion	W65-W74	X71	X92	Y21	
Fall	W00-W19	X80	Y01	Y30	
Fire/burn	X00-X19	X76-X77	X97-X98	Y26-Y27	Y36.3
Firearm	W32-W34	X72-X74	X93-X95	Y22-Y24	Y35.0
Machinery	W24, W30-W31				
Natural/environmental	W42, W43, W53-W64, W92-W99, X20-X39, X51-X57				
Overexertion	X50				
Poisoning	X40-X49	X60-X69	X85-X90	Y10-Y19	Y35.2
Struck by, against	W20-W22, W50-W52	X79	Y00, Y04	Y29	Y35.3
Suffocation	W75-W84	X70	X91	Y20	
Transport-related	V01-V99	X82	Y03	Y32	Y36.1
Motor vehicle traffic					
Occupant	V30-V79 (.4-.9), V81.1, V82.1, V83-V86 (.0-.3)				
Motorcyclist	V20-V28 (.3-.9), V29 (.4-.9)				
Pedal cyclist	V12-V14 (.3-.9), V19 (.4-.6)				
Pedestrian	V02-V04 (.1, .9), V09.2				
Other	V80 (.3-.5)				
Unspecified	V87 (.0-.8), V89.2				
Pedal cyclist, other	V10-V11, V12-V14 (.0-.2), V15-V18, V19 (.0-.3, .8, .9)				
Pedestrian, other	V01, V02-V04 (.0), V05, V06, V09 (.0, .1, .3, .9)				
Other Land Transport	V20-V28 (.0-.2), V29 (.0-.3), V30-V79 (.0-.3), V80 (.0-.2, .6-.9), V81-V82 (.0, .2-.9), V83-V86 (.4-.9), V87.9, V88 (.0-.9), V89 (.0, .1, .3, .9)				
Other Transport	V90-V99				
Other specified and classifiable	W23, W35-W41, W44, W49, W85-W91, Y85	X75, X81	X96, Y02, Y05-Y07	Y25, Y31	Y35 (.1, .5), Y36 (.0, .2, .4-.8)
Other specified, not elsewhere classifiable	X58, Y86	X83, Y87.0	Y08, Y87.1	Y33, Y87.2	Y35.6, Y89 (.0, .1)
Unspecified	X59	X84	Y09	Y34, Y89.9	Y35.7, Y36.9
ALL INJURY	V01-X59, Y85-Y86	X60-X84, Y87.0	X85-Y09, Y87.1	Y10-Y34, Y87.2, Y89.9	Y35-Y36, Y89 (.0, .1)
Adverse effects					Y40-Y59, Y60-Y84, Y88

¹ICD-10 injury codes apply only to 1999 mortality data presented in this report. This matrix was developed by the CDC to be consistent with the ICD-9 framework (see www.cdc.gov/mmwr/pdf/rr/rr4614.pdf). Drowning is the one external cause that has been redefined in this matrix. Codes for water transportation-related drowning (V90, V92) are included in the transportation codes rather than with the drowning codes. In the ICD-9 version, the comparable codes (E830, E832) were included with drowning. This change was made to be consistent with other mechanisms involved with water transport-related injuries.

²Includes legal intervention and operations of war.

*Natural/environmental includes but is not limited to: animal bites and injuries, insect bites/stings, exposure to extreme cold, heat, weather or altitude, earthquakes, electricity, and radiation.

**Poisoning includes but is not limited to: overdose by drugs (legal and illegal), medicinal substances and biological agents, and inhalation of gases and vapors.

***Suffocation includes but is not limited to: choking, strangling, hanging, and suffocation by plastic.

Interpretation of Selected E Codes

The following list provides sample scenarios to assist with the interpretation of selected ICD9 External Cause of Injury codes. This is *not* a comprehensive listing.

Injury Cause	Manner/Intent	ICD-9 E Codes	Sample
Fall	Assault-Related	E968.1	Pushed down a flight of stairs.
	Self-Inflicted	E957.0-E957.9	Jumped off building with intent to harm self
	Unintentional	E880.0-E886.9 E888	Fell off of bed. Tripped down stairs. Slipped on ice. Fell during football game.
Fire/Burn	Assault-Related	E961, E968.0, E968.3	Purposely burned by boiling water thrown by another person.
	Self-Inflicted	E958.1, E958.2, 958.7	Purposely burned oneself with cigarette.
	Unintentional	E890.0-E899 E924.0-E924.9	Spilled hot coffee. Burned on stove. Burned in bath water that was too hot.
Motor Vehicle Traffic -Motorcycle	Unintentional	E810-E819(.2, .3)	Rider injured in crash with truck. Motorcycle slid on gravel.
Motor Vehicle Traffic -Occupant	Self-Inflicted	E958.5	Driver purposely ran into telephone pole.
Motor Vehicle Traffic -Occupant	Unintentional	E810-E819(.0, .1)	Car rear-ended at stop sign. Head on collision with another car.
Motor Vehicle Traffic -Unspecified	Unintentional	E810-E819(.8, .9)	Injury to someone involved in motor vehicle crash but unknown if occupant, pedestrian, etc.
Overexertion	Unintentional	E927	Pulled muscle during sports. Twisted ankle walking down stairs. Injured back lifting heavy boxes.
Pedal Cycle: motor vehicle & non-motor vehicle- related	Unintentional	E810-E819(.6) E800-E807(.3) E820-E825(.6) E826.1 E826.9 E827-E829(.1)	Fell off bike on mountain trail. Hit by a car while riding bike in the street. Ran into a pedestrian on the sidewalk. Ran into a dog with tricycle.
Pedestrian: motor vehicle & non-motor vehicle- related	Unintentional	E810-E819(.7) E800-E807(.2) E820-E825(.7) E826-E829(.0)	Hit by car while walking across street. Collision with bicycle courier. Run over by three-wheeler.
Poisoning	Assault-Related	E962.0-E962.9	Was served drink intentionally laced with pesticide.
	Self-Inflicted	E950.0-E952.9	Purposely breathed exhaust fumes from car. Intentional overdose of sleeping pills.
	Unintentional	E850.0-E869.9	Child drank cleanser from bottle under sink. Unknowingly ate poisonous mushroom.
Nature/Environment: (e.g., animal bites, insect stings, exposure to cold/heat, earthquake, etc.)	Unintentional	E905.0-E905.6 E905.9 E906.0-.5 E906.9	Bitten by any animal, including dog, cat, rat, or snake. Bitten or stung by an insect, including bee, wasp, spider, scorpion.
Struck by/against	Unintentional	E916-918	Struck by falling box. Crushed fingers in car door. Collided with another player during football game.
Suffocation	Assault-Related	E963	Person strangled.
	Self-Inflicted	E953.0-E953.9	Hanged self.
	Unintentional	E911-E913.9	Choked on piece of meat.

